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VOLUME XXVII JULY, 1927 No. 1

PUBLIC HEALTH AND THE PUBLIC HEALTH SERVICE*

By HUGH S. CUMMING, M. D.
Washington, D. C.
Surgeon-General of the United States Public Health Service

MR. PRESIDENT and members of the Medical Society of the State of California:

I hope you will permit me to express, not in any conventional manner but with real sincerity, the very great pleasure I feel in the privilege of addressing this representative body of the medical profession of the state of California. The Pacific Coast may be a long distance from the national seat of government, but this does not lessen one whit our interest in the activities of the great West, whether they be medical or otherwise.

My pleasure on this occasion is emphasized in that I am to talk of public health and more particularly of the Public Health Service, with which I have been associated for so many years, and which for the past few years I have had the honor of directing. For other reasons, this topic and this occasion are all the more congenial in that it affords me the opportunity of talking largely to clinicians rather than to an audience of sanitarians.

The modern public health movement is young, younger than most of us realize. It requires a backward glance to make us appreciate how far this movement has gone in the space of but a few years. I have time for only a word or two on the history and development of this great movement.

Stimulated by the development of the scientific spirit and the growth of Christian humanitarianism, Europe's heritage of the Middle Ages, the modern public health movement may probably be said to have begun with the creation of the General Board of Health of 1848 in England, because for the first time in human history this legislation recognized the care of public health as an important governmental function.

In our own country this movement is but little more than a half century old and originated in the state of Massachusetts where the first State Board of Health was established in 1869 as the result of the important report of the Massachusetts Sanitary Commission of 1850.

About the same time in the city of New York, as a part of the fight against the notorious Tweed ring, a sanitary survey of the city was made under the direction of Stephen Smith which disclosed such startling sanitary conditions as to lead in 1866 to the passage of the Metropolitan Health Law, the far-reaching provisions of which have had much influence in subsequent health legislation throughout the United States.

In reading the literature of this period, barely more than a half century ago, it is difficult for us to realize the sanitary conditions which prevailed. Their description reads more like a page out of the Dark Ages, so tremendous has been the change wrought in even a few years. To you who would get a picture of that time, I can recommend Stephen Smith's book, "The City That Was."

For the present occasion, however, we are less interested in historical details than in the ideas and theories—the fundamental conceptions of disease—which dominated this movement in the various phases of its evolution. The character of the movement has changed with the development of medical thought and discovery, and will, of course, continue to change so long as it is alive, for, as Cabell puts it, "to stay still can be esteemed a virtue only in the dead."

The dominant idea in medicine when this movement was born and the working program of the sanitarian was based on the filth theory of the generation of epidemic disease. The doctrine of miasm and similar ideas held full sway over the medical mind of this period. Under such ideas the prevention of the spread of disease lay in the "general cleaning up" of man's environment and all sanitary effort was devoted to this end. These ideas were tenacious and they were given up slowly. It has been noted even in our own time that a serious attempt was made to eradicate yellow fever from Havana by the general sanitation of the city without any appreciation of its infectious nature and its propagation by living agents of infection.

It is to be noted that this working hypothesis of disease, while leading sanitarians into many blunders and showing unsatisfactory results in the prevention of the spread of infectious disease, nevertheless was instrumental in the establishment of many sound sanitary principles, such as, for example, better water supplies, the proper disposal of sewage, prevention of stream pollution, removal of nuisances, cleanliness of streets, ventilation, and other similar matters.

While there existed no real appreciation of infection and infectious disease, yet medical men of this time, and even previously, were not entirely without some idea of contagion. Quarantine and isolation were practiced in the Middle Ages, and the Hebrews, as shown clearly in the Scriptures, applied these methods intelligently and successfully. Quarantine was widely used during the Middle Ages against such scourges as smallpox, leprosy, plague and typhus, and was not without effect. Indeed in the case of leprosy these methods, while oftentimes inhumane and even barbaric in their application,

* Read before the California Medical Association in General Session, Los Angeles, April 28, 1927.

were successful to the point of eradicating this disease from most of western Europe. Maritime quarantine, too, during the fourteenth century was introduced by Venice against plague.

With the advent of Pasteur's notable discoveries and the firm establishment of the doctrine of living microscopic agents as the cause of disease, together with the foundation of the modern science of bacteriology, the public health movement passed into another stage. Previous to this time sanitary science was groping blindly. It now found itself on surer ground and could attack communicable disease in a way undreamed of by past generations. To detail the developments which followed would almost be to tell the story of modern medicine. Thus having passed through the periods of the alleviation and suppression of disease through sanitation of man's environment, the public health movement, with a fuller realization of the sources and modes of infection, had now entered the period of the prevention of disease, when its chief effort was devoted to the control of the communicable diseases.

With the next stage in the development of this movement, we come to our own day, and to the so-called "New Public Health," when the objective of the sanitarian passes from the negative formula of the prevention of disease to the much more positive formula of the promotion of health with all that is thus implied; and with especial emphasis on popular sanitary education rather than the enforcement of sanitary law. This does not mean that there has been any abandonment of previously well-established principles and practices. It signifies rather a progressive step based on past developments with a more comprehensive grasp of the fundamental aspects of the problem presented.

This policy obviously greatly broadens the scope of the movements, and incidentally introduces many corollaries which are themselves productive of embarrassments of one kind or another. The breadth of this policy may perhaps be better appreciated by quoting a definition which has been formulated to express modern public health, which reads as follows: "The science and the art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will insure to every individual in the community a standard of living adequate for the maintenance of health." (Winslow.)

In this development of public health the Public Health Service has had its share and has itself had to undergo its own process of evolution.

Established more than a century ago by act of Congress passed in 1798, as the Marine Hospital Service, for the care primarily of seamen of the American merchant marine, it has, through a gradual process, been developed by different acts of Congress to its present position as the national public health agency. Located originally in the Treasury Department by reason of its relationships with the Customs Service and other maritime agencies, it has remained in this department, where it has thrived. Its first public health development, about 1878, most naturally concerned the maritime quarantine of the country, which function gradually passed from the control of the states to the control of the national government.

In the 90's it was charged with the responsibility of interstate quarantine matters and the development of cooperative relationships with state and local health agencies. The Hygienic Laboratory was established in 1902. By 1912 the Service had assumed under law the full responsibilities and powers of the federal public health agency and its name was accordingly changed to the Public Health Service. It still continues also to operate its system of marine hospitals.

As a Bureau under the Treasury Department, it operates under the administrative supervision of an assistant secretary of that department, with a surgeon-general as its immediate administrative head. This Bureau is divided into seven administrative divisions by which its various field stations are organized and managed. It is a Civil Service operating under a military organization, and the nucleus of its personnel is a group of commissioned officers. It employs other classes of professional personnel under Civil Service law and regulation. It is a mobile organization and its personnel can be moved from place to place to meet various demands and emergencies. Its professional personnel includes not only medical men, but dentists, sanitary engineers, research workers and various highly specialized other personnel, in addition to female nurses, aides, and dietitians.

The total personnel of the Service numbers approximately 8000, but in this total are included a large class of persons who are employed on purely a nominal salary for the purpose of rendering assistance in collecting statistical data. In reality its personnel numbers only about one-half of this total.

The total appropriations made by Congress for the support of this Service approximate about $10,500,000 annually.

The broad functions of the Service as laid down by law may be summarized as follows:

Operation of marine hospitals, protection of the country from without through the operation of a maritime quarantine system, protection of the country within through interstate quarantine laws and regulations, cooperation with state and territorial health officers through annual conferences and otherwise, investigation of the diseases of man, supervision and control of biologic products and public health education and the dissemination of sanitary information.

These functions are discharged through the administrative divisions of this Bureau and cover all phases of public health besides the operation of about twenty-five marine hospitals.

The marine hospitals are very active and their work increases each year. During the past fiscal year these hospitals furnished about 1,300,000 in patient days of relief, gave 600,000 out-patient

treatments, 110,000 dental treatments and made 100,000 physical examinations. The patients treated in these hospitals are primarily seamen of the American merchant marine, but in addition a great deal of work is done for official patients of one kind or another.

In the protection of the United States against the importation of disease from without, this Service operates the maritime and border quarantine system of the United States and its dependencies. During the last fiscal year it inspected about 27,000 vessels and about 3,250,000 persons in the performance of this duty.

As a part of this function, the Service also conducts the medical examination of immigrants and last year inspected about 1,500,000 such immigrants, including seamen. It is interesting to note that in the last year or so the Service has developed an organization for the medical examination of aliens in Europe previous to their embarkation for this country. This departure, which from one cause or another had been postponed for some years, is now well established and has proved very successful. It is a distinct advance over old methods and will, doubtless, continue to grow.

In the management of its domestic quarantine through the interstate quarantine laws and regulations, the Service has instituted measures for the control of water supplies on common carriers, assisted in the sanitation of the National Parks, been active in stimulating the development of State Departments of Health, instituted a campaign for the eradication of trachoma, developed rural sanitation, assisted in the suppression of epidemics and greatly broadened its cooperative relationships with state and territorial health officers.

Its program in scientific research is broad and concerns not only strictly scientific investigations in the Hygienic Laboratory in Washington, but also investigations in the fields of clinical medicine, statistics, public health administration, and various other matters, cooperating with many other agencies both official and otherwise. Some of these activities have been of great interest, particularly its researches with regard to tularemia and Rocky Mountain spotted fever. It has also entered the field of industrial hygiene, mental hygiene, stream pollution, health administration, and the sanitary control of milk.

The Hygienic Laboratory, which is a large institution, has obtained a position of distinct importance in sanitary science. It is organized into Divisions of Pathology and Bacteriology, Zoology, Chemistry and Pharmacology, and carries on a variety of activities.

Here, also, is conducted the very important function of the supervision of all biologic products which are sold in interstate traffic. When the clinician buys diphtheria antitoxin on the market, the Public Health Service guarantees that this package contains a sterile and a potent article. All manufacturers of biologic products must be licensed by the Public Health Service, their establishments are regularly inspected and their products are regularly tested. They must conform to standards laid down by the Public Health Service. This involves a very large amount of highly important work.

Through the publication of its weekly journal, *Public Health Reports*, the Service distributes information concerning the health of the world, and assumes the responsibility for collecting a large amount of statistical data which has proven of great value to sanitarians. In addition to this, it issues a large volume of literature on a variety of scientific topics.

Through the Venereal Disease Division of the Bureau, this highly important subject is receiving as much attention from the federal government as funds will permit. This organization has been instrumental in developing clinics, spreading information, educating the public, and cooperating with the various states.

Of course there is a division in this Bureau for supervising accounts, making accountability of public property and managing the personnel. Medical officers are secured through rather severe physical and mental examinations and are then commissioned in the regular service.

It is tiresome, perhaps, to mention even these few details of the large volume of work performed by this Service. It is not my desire so much to give details as to try to give some comprehensive idea of the position occupied by the national health service and the responsibilities with which it is charged. I wish I had more time to point out clearly how, by reason of its official position and its cooperative relationships, this Service has been able to render assistance in such matters, for example, as the sanitary regulation of the shellfish industry, the investigation and satisfactory settlement of the question of the hazards involved in the use of tetraethyl-lead-gasoline in the operation of motor cars, and the introduction of a standard milk ordinance which would insure uniform sanitary control and standards throughout the United States. I mention these particular matters because they represent and because they illustrate so convincingly how, by reason of its position, the Public Health Service is able to bring together not only sanitary and scientific agencies but commercial as well.

It is to be emphasized that the Public Health Service occupies a very definite field of its own. It does not duplicate the work of, or interfere with the activities of, the state and other local health organizations, whether they be official or otherwise. It occupies, however, a very strategic position between these state and local health agencies on the one side and international health agencies on the other. Indeed it is so placed that it may lend great assistance to other agencies and do much to stimulate and coordinate health activities of various kinds without in any way interfering with the prerogatives of others, or with their peculiar fields of endeavor.

It makes me happy to think that as we have grown in knowledge and experience, perhaps we have grown in grace, because I think truly that never before in the history of public health has there existed such happy cooperative relationships as now exist between the Public Health Service and the various state and local health organizations of this

country. It is only through such cooperative relationships that we may expect to secure real progress in this vital movement. I say it reverently, but I think we might add to the Beatitudes, "Blessed is the man who cooperates, for he shall find favor with his fellow-men and achieve much."

I must leave to others to say how well this Service has achieved its task and how fully it has met its responsibilities, unless I should assume the attitude of George Bernard Shaw, who on one occasion in speaking of his own work said, "Were I to tell the truth about myself, I must needs seem vainglorious; while to tell less than the truth, I should do myself an injustice and deceive my readers."

I do not think I could do better under these circumstances than to quote a recent statement made by Dr. William H. Welch before a committee of Congress, when he said: "The growth of the Public Health Service today has placed it in the front rank among corresponding agencies of government in other countries. . . . This Service has been one of the great forces for the improvement of local health administration. It has been actuated by the very sound argument that the primary responsibility is with the local community and it has strengthened this feeling and greatly stimulated the development of local official health organizations." I may add that Professor Rosenau of Harvard, for many years an officer in this Service, has happily said: "The United States Public Health Service is an admirable example of governmental usefulness."

I should like to comment incidentally on the very pervasive character of the modern public health movement with special reference to criticisms which are made that the public health functions of the national government are scattered in a score or more of its departments. I do not think it is fully appreciated that the scope of the modern public health movement is so broad that a very large number of governmental activities present certain limited public health aspects. This does not, however, by any means imply that such governmental activities are in any sense public health activities, and it would be very unsound from any point of view to attempt to place all such activities under one administrative head.

It is true, however, that in the development of national public health all public health activities of the national government are not coordinated as they should be. The Public Health Service has now reached the point where it can fairly be considered as *the* agency of the national government for the administration of all public health matters, and during the last session of Congress there was introduced a bill, known as the Parker Bill, which recognized this fact. This bill did not originate with the Public Health Service, and for the first time in the history of sanitary legislation all who are interested in the progress of public health are agreed on a piece of sanitary legislation. This bill provides for some reorganization of the public health activities of the national government and recognizes the Public Health Service as the nucleus around which such reorganization should take place. It is an important measure, and it is my earnest hope that it may become law within the more or less near future.

While the public health movement alone cannot claim entire credit for the results which have followed, because there are many factors in such a situation, yet with justice it may claim a large share of credit for the extraordinary results which have been achieved in the prevention of disease, the decrease in mortality and the prolongation of life, and the achievements have been striking indeed. For example, in half a century about fifteen years have been added to the span of human life in the United States, the infant mortality rate has greatly declined and there has been a striking reduction in the mortality of most of the infectious diseases. But these results have been by no means uniform, and sanitarians are now faced with the problem of shifting their point of attack. The degenerative diseases of advancing life, cancer, cardiac and vascular disorders, as well as certain respiratory affections, have shown no such reduction. On the contrary, the mortality rate of many of these diseases is distinctly increasing. Sanitarians have not been unmindful of these facts and have given much thought to the solution of this problem. To meet this issue will require the development of a program somewhat different from that previously employed, and this program leads back to the clinician. The emphasis in such a program must of necessity be placed upon the individual, and it is the clinician who will hold the key position.

With the specialization which has necessarily taken place in modern medicine, it was assumed, somewhat tacitly perhaps, that the sanitarian occupied his particular field and the clinician his, and that there existed between these two departments of medicine no special relationship. This separation of curative and preventive medicine was an error. We are coming more and more to recognize the unity of medicine and more and more to see that if we are to achieve the desired results, all departments of medicine must cooperate to the one end, which is the prevention of disease and the promotion of health. The separation which has existed between curative and preventive medicine is sound neither in theory nor in practice.

In reading the literature of the modern public health movement, one notes on every hand the growing concern of both sanitarians and clinicians over the present organization of medicine. Situations have arisen which irritate the clinician on one side, and disturb the sanitarian on the other. It is obvious that there exists a situation of great delicacy for which no easy answer can be found. There are, of course, two sides to the question, which perhaps grows more acute with the passage of time. It is the opinion of thoughtful men that it will require the best effort and the best judgment, with the heartiest cooperation, to solve the problems which will face the medical profession in this regard during the next twenty years. I am well aware that the clinician has his own troubles, and yet I feel satisfied that the modern public health movement is sound so far as its objectives are concerned, and I believe that in the future program of this movement

more and more emphasis will of necessity be laid upon personal hygiene. The assistance of the clinician will be necessary to success.

With due regard to all the difficulties of clinical medicine, there is an unanimity on the part of thoughtful sanitarians in their expressions of opinion that the general medical profession has not participated as actively in public health activities as it should have done. Undoubtedly there has been encroachment upon the field of the clinician by the sanitarian, and on the other hand, there has been a lack of sympathy on the part of the clinician with the efforts of the sanitarian. The program of the new public health envisages these two great forces of medicine as working together for the prevention of disease.

If I have taken this opportunity to lay stress on these questions, it is from no selfish reason, but is due only to a very natural anxiety over the possibility of discord within the medical profession. Only with a united front can we hope successfully to "breast the blows of circumstance." Nor is this a matter solely for our own concern. We cannot afford to forget the interests of the public whose welfare is seriously involved. Their attitude will not by any means be uncritical; and since our actions will ultimately be weighed in the balance of public opinion, let us determine that we shall not be found wanting.

THE EDUCATION OF PHYSICIANS*

By WILLIAM WALLACE CAMPBELL
Berkeley
President University of California

IF I may venture to paraphrase a more or less familiar definition of life, I should say that life is just one problem after another. This definition has its evident limitations; but the living of a man's life successfully, in this limited sense, means the solving of his problems, one after another, as they arise.

I incline to think that the physician and the surgeon are especially qualified to pass upon this definition. Are not their professional lives devoted to the solving of a continuous succession of problems; problems remarkable for their great variety; problems which in many cases have to do with life and death?

Colleges and universities have as their principal duty the preparation of young men and young women for successful living; for the partial training of their students, not only that they make the most of their own individual lives during the sixty years, more or less, which lie ahead of them, but that each may contribute something to the successful life of his community, state, and nation. This does not signify that colleges and universities must limit their curricula to subjects which the world calls practical, or even make their curricula chiefly or largely out of practical subjects. The curricula followed by many college men who became famous as successful leaders of thought and action in the world would nowadays be considered completely and thoroughly ideal and unpractical. No man can get the most out of his own life, or contribute worthily to the lives of men and women about him, unless he possess those fine attributes which make life worth living; unless he have a fair degree of culture; unless he develop a spirit of reverence for all good things. These attributes are especially necessary to the success of the physician, who, from the character of the service he is called upon to render, must be the confidant and adviser of individuals and families in matters of great significance.

We run no risk whatsoever in saying that the problems of the future are going to be quite different from those of our past. I do not doubt that there will confront the physician of the future a great variety of new problems, many of them differing widely from those which he will have read about in the books. The educated man must be able to attack his own class of problems, differing from any he ever encountered before, and make progress in their solution. What is the procedure for the acquiring of an education which will permit him to do this? Such an education will not come as a gift. It will come, in essentially all of its important elements, through the efforts of the student himself. College and university can help him, professors can assist him, but they in the last analysis can provide little more than the golden opportunity for the student to educate himself. Education invariably comes from within; it is not conferred from without. Educational institutions and efforts are successful about in proportion as the professors limit themselves to the supplying of expert guidance to the students, and as the students do the work themselves.

The qualities of the curriculum of college or university have much less to do with the qualities of the students than is generally supposed. The most perfect curriculum in the world will fail of its purpose if the professors do too much of the talking in the lecture room, too much of the manipulating in the laboratory, and the students merely listen and "take it easy." A curriculum of only mediocre merit will serve as a successful skeleton upon which to construct a fine educational body if the students work earnestly and thoughtfully, under the wise guidance of their preceptors. The professorial pumping of cold facts and abstract principles into so-called students has never yet made an educated man, nor an educated woman, and it never will. If it is just facts that people want, they should not go to college. Many books, crowded full of facts, have been planned and published to meet their needs. But I should not want to be understood as condemning the lecture system *in toto*. I merely condemn the matter-of-fact lecturer and the matter-of-fact students who depend upon him; to that extent the lecture system is a failure. Upon the basis of observation I venture the guess that 90 per cent of the people of our great country think of a college as an institution consisting of buildings and books, professors and students—and, of course, a football stadium—people who think the full duty of the

* Read before the California Medical Association in General Session, Los Angeles, April 27, 1927.

college is attained when in some mysterious manner the professors get the facts out of the books into the heads of their students. If that were all there is to college and college life, the colleges could well go out of existence.

But returning to our subject: what is the philosophy of an educational program which will prepare able young men and women for the successful practice of the medical profession? What should be their work in college, in preparation for the medical school, and how much time should they devote to it? As I have already said, physicians must deal pleasingly and successfully with people, and there is no denying the fact that for the physician a close approach to a liberal education is essential. This means, in general, three or four years of college education. It means from two to three years of college experience on fundamental subjects, with little or no specialization; that is, before specialization begins. Some medical colleges have definite requirements for admission, e. g., the bachelor's degree; other medical schools require three years of college. Now there are in fact many sophomores who, by virtue of early home training, by virtue of native ability, by virtue of their observational and reasoning powers, are better fitted to take up the study of medical science than are many seniors who actually enter our medical schools. It is unfortunate that entrance requirements, in behalf of administrative simplicity, penalize many meritorious applicants in this way. It is one of the bills we pay for basing our educational systems upon the *average* ability of the students.

There has in recent years been introduced into many colleges the practice of making mental tests upon applicants for admission to the freshman or later years, and there also have arisen doubts as to the sufficiency and efficiency of these tests; at least, there have been many disappointments. In view of the special and high qualities which candidates for the degree of Doctor of Medicine should possess, in view of the extremely high cost of medical education, in view of the limited numbers who can be accommodated in the medical schools, should students be admitted to the study of medicine exclusively upon their scholarship marks in college, or yet upon examination records and intelligence tests combined; or should individual candidates be interviewed and observed by a competent board for still other and more general reasons? We should not overlook the fact that the cost of carrying students through some of the medical schools in the United States, and graduating them as Doctors of Medicine, is as high as $10,000 each, not counting the sacrifices of time and money and earning power which the students themselves will have made. Certainly the unpromising student should not keep out the promising.

Recalling, again, that physicians are concerned with the solving of difficult problems, great stress in medical education should undoubtedly be placed upon the fundamental subjects in the curriculum; or, at least, upon the fundamentals before the specials. If the fundamentals are passed over lightly, and the specialties pursued unduly early, the preparation is really for a vocation, not for a profession. The same false doctrine as to the education of a civil engineer would enable the engineering graduate to build a bridge just like one that has been built earlier by somebody else, but not to design an entirely new bridge to meet new and quite different conditions. The mechanical engineer who has been trained in specialties, and not in the fundamentals of his subject, may repair a locomotive, or build a locomotive that will be just like an existing one, but he will not be expected to succeed in designing an entirely new type of locomotive to meet the needs of new developments in railway transportation. The designer, to be successful, must know the fundamentals of mechanical engineering; and so it is in medicine and in every subject.

Two or three decades ago, when weak medical schools gave up their struggle for existence, and a smaller number of strong schools emerged and further developed themselves, elaborate medical-school curricula were formulated. The faculties and students in those medical schools seemed to be happy in their curricula. However, the many and splendid discoveries made in medical science, the development of new methods, the growing preference of young medical graduates for city residence and practice—for city offices in which they could practice specialties, and have their patients come to them—these conditions have led to impossible demands upon the existing curricular systems; and the curricular contentment of old has turned into dissatisfaction. In all the forward-looking colleges and universities of America there has for two or three years been a serious questioning of the sufficiency of their curricula, and a growing lack of confidence in their methods. In no department of education is this more evident than in the medical schools. The lecture system has gone too far and into too much detail: good students do not need so many lectures. There are too many units of requirement in the curricula: good work done on a small number of subjects is vastly better, educationally, than poor work on a great number. The conscientious students do not have enough time to reflect upon their work, not enough time to think of what it is all about; and the nonserious students have too much of their work done for them by the professors. It is in response to the feeling of dissatisfaction with methods and results in the present-day medical schools that positive and definite efforts are now being made in behalf of curriculum simplification.

In my opinion, the first essential in the education of a student for success in the medical profession is a good knowledge of the language with which he is called upon to express himself. Then, aside from such cultural studies as literature, history, and foreign language, the need for thorough knowledge of some physics, much chemistry, and the fundamentals of zoology, is imperative. Those subjects should be mastered by the *good* students, insofar as prospective medical students need them, not later than the end of the junior year in college. The preclinical subjects, such as bacteriology, anatomy, physiology, biochemistry, are studies, I think we may all agree, which should be taught to intending physicians with the utmost thoroughness, and no stu-

dent should be permitted to go on to his clinical years until he has mastered them; they are absolutely fundamental to his success as a scientific physician. They should be taught as sciences, not as collections of facts. I incline strongly to the belief that they can be taught a great deal better in the environment of university atmosphere than in the atmosphere of a medical school which occupies an isolated position away from a university, no matter how excellent the medical school may be. The teaching of these fundamentals alongside the clinical activities would doubtless be of some benefit to the clinics, but will the near presence of the clinics help vitally in the study of these fundamental subjects? It is important, in my opinion, that students of these fundamentals should be immersed in the atmosphere of scholarship, rather than in that of the art and the practice of medicine. The activities of the clinical years are different in their nature, but it would be well if they too could enjoy the advantages of the general university atmosphere. The geographical attachment of the preclinical and the clinical services to the University has the advantage that the students may learn something of the nature and methods and purpose of research in medical science; of efforts, for example, to discover, and understand better, the functions of all the many parts of the human body, even though the medical students may not, in the great majority of cases, find time or have the special ability to engage usefully in research. However, those students who have, or may develop the worthy ambition to engage in this superlatively important activity, may remain in this work, or return to it after acquiring their degrees.

But here I insert a precaution: knowing something about the tendency of many professors to veer in the direction of research, the learned and wise dean of the medical school and his advisory board will zealously guard their right and duty of specifying that the contents and scope of the courses in the fundamental, preclinical subjects shall be adapted to the needs of the medical school.

I have but second-hand and superficial knowledge of what the clinical years should include, or attempt, but I do believe that they have been attempting to do too much formal teaching and, in general, too little learning by the process of individual doing.

Personal responsibility is the greatest educator there is. A lawyer who practices in court gets wonderful discipline out of the fact that on the other side of the table is always an opposing attorney, who is "lying in wait" for any slip he may make. The attorney who advises a great corporation as to correct procedure, or, for example, as to the legality of a proposed bond issue, must make no mistake whatever. We let students through college and medical school and university if their examination papers are 70 per cent or 75 per cent correct. The attorney who advises on questions of legality, the engineer who plans the piers for the substructure and the trusses for the superstructure of an important bridge must attain full 100 per cent of correctness, or as an alternative pay a heavy penalty. A physician in practice learns more responsibility than he did in medical school, for in many cases death is at his elbow, ready to take advantage of any mistake he may make.

There remain many questions concerning medical education, and perhaps none more interesting than this: how many years should the young man who would be a general practitioner devote to his college and medical education? No one can safely be specific on this subject, except for the average student. The tendency of the last quarter century has been to require more and more years of college preparation, and more and more years in medical school. I wonder if there is any basis for the suspicion that we are requiring the devotion of too much time. I venture an opinion only upon the basis of analogy, and it relates only to the best students, the real students. It is certainly true that the bachelor of arts who devotes more than three years of postgraduate study to securing his doctor of philosophy degree, with ambition ultimately to become a university professor, is in general making a mistake; he is likely to go stale; he is running a serious risk of undermining his powers of initiative. He should delay no longer in assuming responsibility. He should stop taking on formal knowledge from others and begin to give out something of himself to others. By being under the necessity of making vital decisions, he will educate himself as nobody else can ever hope to educate him. The physician as the devotee of a learned profession, the professor who serves serious students of serious subjects, must go on educating themselves by the very process of serving others successfully.

Here is a true story of a noted professor of physics, and of a high school teacher who chanced to attend one of the lectures in the professor's most advanced course. After the lecture the high school teacher expressed to the professor her regret that she did not know much about his subject, because, she said, "I have never taken a course on that subject." "Neither have I," said the professor. The young woman suffered from the complex that in order to learn something about a subject she must elect and pursue a course on that subject. The professor, fortunately, was not so afflicted. This story has a lesson for all of us. Those who can give out only what they have received from others are not real scholars; they will leave the world, so far as they are concerned, just as they found it. Those who, in their student days, mastered the fundamentals of their curriculum can of themselves not only obtain a mastery of the new things in their subject as they are announced and published: through thought and work they may even hope to make contributions to the extension of the subject. That is precisely what the professor of physics did. That is why our store of knowledge of electricity, and mathematics, and medical science, and so on through the whole range of human endeavor, is tremendously greater than it was 100 years, or 50 years, or 25 years, or even 10 years ago. That is why a physician or a surgeon, thoroughly rooted and grounded in the fundamentals of his science in college and medical-school days may, as a condition essential to the successful practice of his profession, keep himself thoroughly abreast of the times in his special field of endeavor.

THE ANTIRACHITIC VALUE OF HUMAN MILK*

By HENRY J. GERSTENBERGER, M. D.; J. I. HARTMAN, M. D. AND D. N. SMITH, B. S.
Cleveland, Ohio

RICKETS today is accepted to be a metabolic disorder affecting the body as a whole. Its clinical picture, however, is the result of the pathological changes which develop principally in the osseous system, and also in the muscular and nervous systems.

Its prime and basic cause, in our opinion, is the inadequate exposure of the human skin to the actinic rays. Another factor that plays a fundamental rôle in the production of the clinical picture of rickets is growth. Diet also contributes to the development of human rickets, but, in our opinion, only in a secondary manner. We, therefore, consider rickets as far as human infants are concerned to be rather a climatic than a dietetic disorder.

Various workers, however, especially Shipley [1] and his associates have demonstrated that rickets can be produced in rats by dietetic measures, namely, by bringing about a disproportion between the calcium and inorganic phosphate content of the diet. By reducing the inorganic phosphate and at the same time raising the calcium per cent of the food; or vice versa they can produce rickets in the rat or by keeping the two minerals in a proper balance to each other they can prevent its occurrence. Such conditions of abnormal mineral balance, however, do not apply to the diets consumed by the human infants, inasmuch as milk in some form constitutes the principal part of their diets or, for six months at least, the whole of it. Both in human and in cows milk enough calcium and inorganic phosphate are present and in a relationship that is satisfactory from the standpoint of rickets prevention. Consequently, it seems improbable that the diets of human infants play a fundamental and primary rôle in the development of rickets. Nevertheless, while it is known that a large number of infants subsisting on human milk become rachitic, it is generally recognized that such breast-fed infants do not as a rule develop rickets as readily and as severely as do infants fed cow's milk. Is not, therefore, rickets after all fundamentally a dietetic disorder? But, if rickets is primarily a dietetic disorder in the human infant, are we not justified in expecting human milk to prevent the appearance of rickets or to cause its cure providing that the diet of the mother be adequate? Such has been the experience in the Orient of the students of the dietetic disease beri-beri. The answer to the above-stated question was the object of the work which we wish to discuss with you today.

In order to assure ourselves of the adequacy of the diet of the human mothers whose milks were to be tested for their antirachitic value, we gave to the mothers, in addition to the regular diet consisting of milk, meat, vegetables, cereals, and fruits, one tablespoonful of cod-liver oil daily. The oil was administered by the nurse in charge of the wet-nurses and was in each instance taken from a lot of cod-liver oil which had been found effective in preventing and curing rickets in infants receiving it as a part of the food* serving as their diet. Consequently we know that the diet of the mothers was abnormally rich in its content of the antirachitic factor.

Our first observations on two patients were made during the early summer of 1925 and were inconclusive in that one of the infants showed an improvement of his rickets as judged by the roentgenogram, while the other remained refractory. As an explanation of these contradictory findings we offered to ourselves two possible reasons, namely: first, that the infant who showed signs of healing had received effective antirachitic therapy before admission to the hospital and that the human milk given it by us played no rôle in the improvement produced, and, second, that the other infant failed to present any signs of healing because it had received the milk after it had been canned, whereas the other patient had received its milk in a fresh state. The latter reason was considered most improbable in view of our own extensive and satisfactory experience with food* mixtures containing a relatively small amount of cod-liver oil, as compared with the doses ordinarily advised and prescribed for the prevention or cure of rickets, and being in the process of manufacture sterilized under pressure exactly as the human milk had been. In the literature,[2] too, data are available which show that the antirachitic factor is decidedly more resistant to heating and oxidation processes than is the fat soluble "A" growth factor. Consequently we decided to observe suitable cases of rickets long enough to be certain that any antirachitic which possibly had been administered before admission to the hospital had had ample opportunity to give evidence of its effectiveness in the roentgenogram and in the blood serum. In this work, which will be reported elsewhere, we learned that the preliminary observation period should last from three to five weeks.

Three patients who had gone through observation periods for 48, 38 and 67 days respectively, were given the milk produced by the wet-nurses on the cod-liver oil diet. Two of these received the milk in canned form and one in fresh form. Inasmuch as all three infants failed to show any signs of improvement, no superiority of the fresh milk as to its antirachitic potency over the canned could be registered.

The following charts (see Charts I, II, and III) and roentgenograms (see Chart I) give in detail the data recorded on admission to the hospital and during the periods of observation and study as to diet, therapy, weight, roentgenograms, and blood serum calcium and inorganic phosphate figures.

In the first division of the charts is shown the blood serum calcium and inorganic phosphate levels, and in the division marked x-ray the check marks

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*S. M. A. and Protein S. M. A.

show the time at which the roentgenograms were taken which showed no healing changes. The black columns indicate healing changes in the roentgenograms, and the height of the black columns indicates in a rough way the amount of healing present. The division marked K. O. C. shows the electrical excitability as measured in milliamperes. In the last division is shown the diet, therapy, and the weight curve.

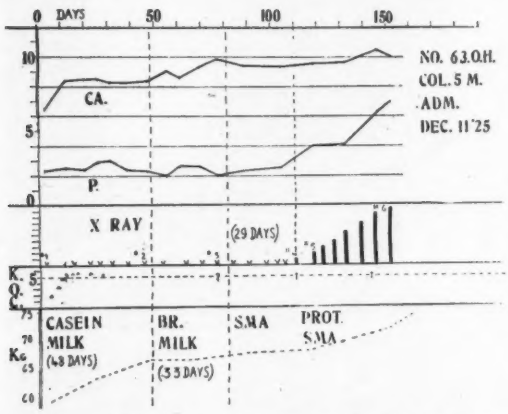


Chart 1—Patient, O. H. Received casein milk for forty-eight days. Was then given 1000 cc. per day of canned human milk for thirty-three days from mothers receiving cod-liver oil; no healing changes. S. M. A. for twenty-nine days, and protein S. M. A. the remainder of the time. First signs of healing appeared twenty-nine days after S. M. A. was started.

It is clear from these records that milk obtained from mothers receiving adequate diets including one tablespoonful of cod-liver oil daily is not able to improve rickets in its active nonhealing form within a time period that has been established as more than

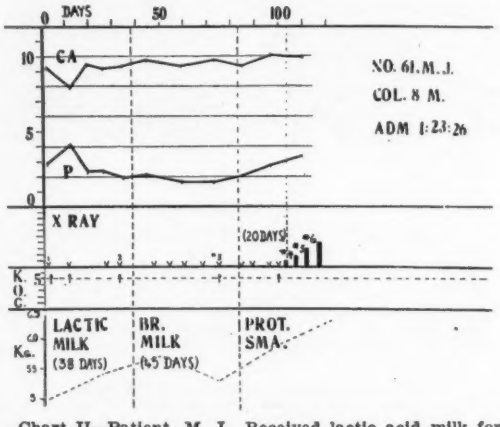


Chart II—Patient, M. J. Received lactic acid milk for thirty-eight days. Then given 850 cc. per day of fresh human milk for forty-five days. This milk was obtained from mothers receiving cod-liver oil. No healing changes. Protein S. M. A. for the remainder of the time. First signs of healing appeared in the roentgenogram twenty days after protein S. M. A. was started.

ample for food mixtures containing from 2.2 to 3.5 cc.[3] of cod-liver oil per liter and for exposure to the rays produced by the mercury vapor arc and by the carbon arc.

Inasmuch as the healing of the rickets in these

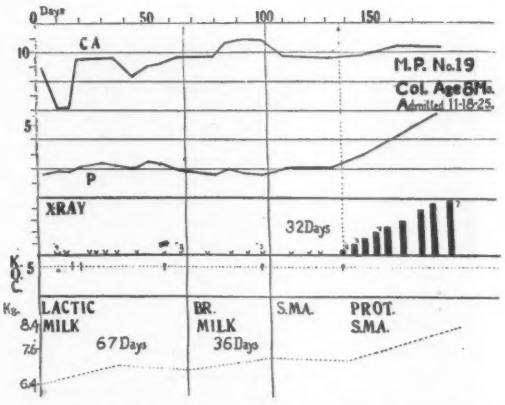


Chart III—Patient, M. P. Received lactic acid milk for sixty-seven days. Then given 1000 cc. per day of canned human milk for thirty-six days. This milk was obtained from mothers receiving cod-liver oil. No healing changes. S. M. A. for thirty-two days, and protein S. M. A. for the remainder of the time. First signs of healing in the roentgenogram thirty-two days after S. M. A. was started.

cases did not occur until after 29, 20 and 30 days respectively of adequate antirachitic therapy, we can at least add a minimum of 18 days to the number of days during which the infants received the human milk and accept the resulting figures as the time allowed the human milk to demonstrate its antirachitic power. For the three patients these figures are as follows: O. H., 51 days; M. J., 63 days; M. P., 68 days.

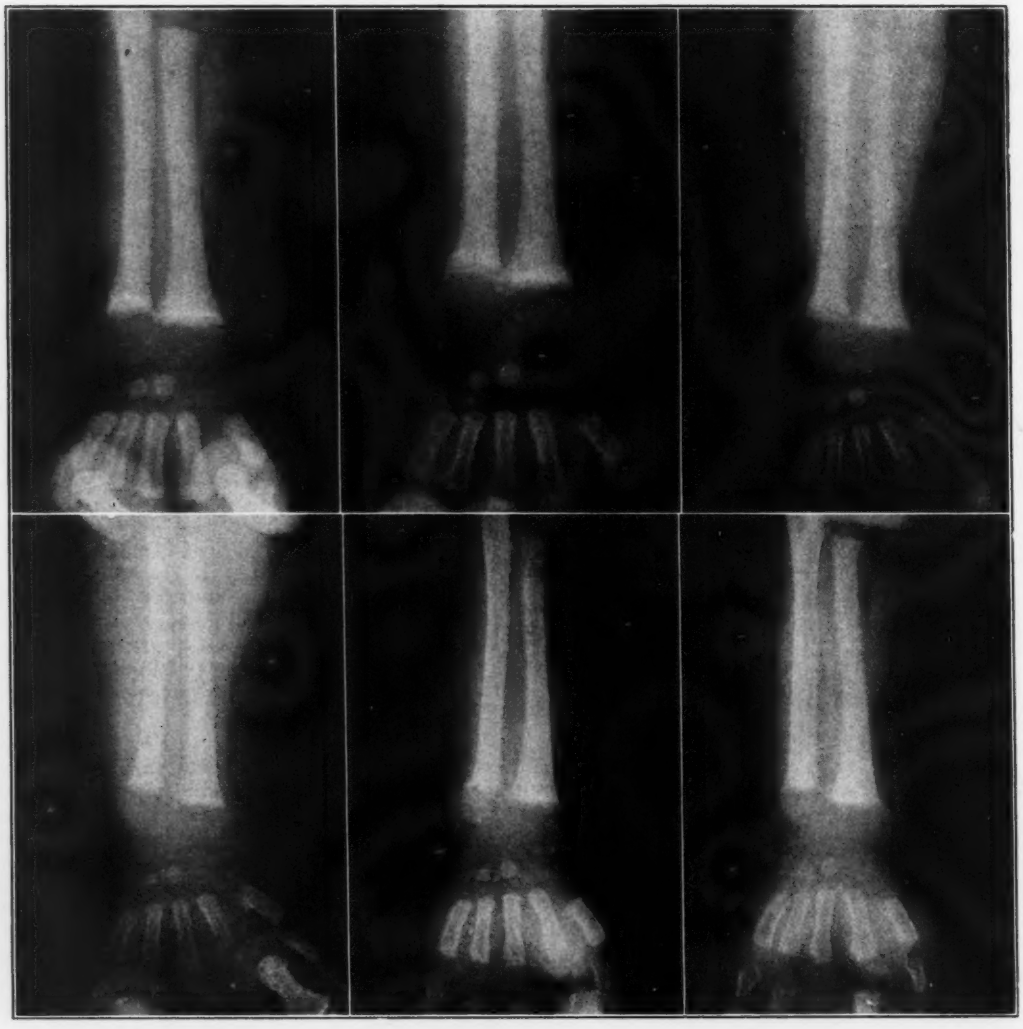
These negative results observed by us correspond with those reported by A. F. Hess[4] and his coworkers for rats. Hess[5] also has reported that human infants whose mothers had received cod-liver oil during the last part of pregnancy were no more protected against the development of rickets than were infants whose mothers had been given no cod-liver oil.

McCollum[6] and his coworkers, however, recently have reported results in rats which indicate that if the diet of the rats is less severe than the one used by A. F. Hess, and if the mother rats get a rather liberal amount of cod-liver oil added to their food, the milk produced by them will contain enough of the antirachitic factor to protect quite well the offspring against rickets. Kennedy and Palmer have also reported that they were able to cure rachitic rats by feeding them a minimum of 8 per cent of their diet in the form of human milk fat obtained from mothers on a liberal general diet including small amounts of cod-liver oil.

Whether or not the milk of our mothers did contain some of the antirachitic factor as the result of the daily intake of one tablespoonful of cod-liver oil, of course, is not known. It is conceivable that had we waited still longer we might have recognized its presence. However, even though this were found to be true, we still would have to conclude that the amount of antirachitic factor present in the milk of our cod-liver-oil-fed human mothers was wholly inadequate from the standpoint of curing rickets in human infants and also probably from that of prevention.

A year ago, Hess,[7] Weinstock and Sherman re-

X-ray 1-a X-ray 1-b X-ray 1-c



X-ray 1-d X-ray 1-e X-ray 1-f

Roentgenogram I-a—Patient, O. H. Taken on admission showing active rickets. No signs of healing.

Roentgenogram I-b—Patient, O. H. Taken after forty-eight days of casein milk. No signs of healing.

Roentgenogram I-c—Patient, O. H. Taken after thirty-three days of canned human milk from mothers who had received cod-liver oil. No signs of healing.

Roentgenogram I-d — Patient, O. H. Taken after twenty-nine days of S. M. A., and seven days of protein S. M. A. Definite signs of healing.

Roentgenogram I-e — Patient, O. H. Taken after twenty-nine days of S. M. A., and eleven days of protein S. M. A. Marked healing.

Roentgenogram I-f — Patient, O. H. Taken after twenty-nine days of S. M. A., and thirty-one days of protein S. M. A. Nearly completely healed.

Roentgenograms I (a-f)—Patient, O. H. Compare with Chart I. These roentgenograms show: first, active non-healing rickets; second, the ineffectiveness of forty-eight days of casein milk and thirty-three days of human milk from mothers receiving cod-liver oil; third, the effectiveness of S. M. A. and protein S. M. A.

ported that the milk of a human mother had no curative effect on the rickets of rats when given in the dose of 25 cc. daily. When, however, this same mother was liberally exposed to the rays of the quartz mercury vapor arc lamp, the milk produced by her cured rickets in rats, producing a marked calcification of the epiphyses.

On the basis of our own negative findings with human milk from cod-liver-oil-fed mothers and of Hess' positive results in rats fed with human milk from the mother exposed to the quartz lamp, we decided to carry out the same plan as used by us in checking the antirachitic value of human milk obtained from cod-liver-oil-fed mothers in determining the antirachitic value of human milk from wet-nurses exposed to the quartz mercury vapor arc;

i. e., we gave this milk to human infants in the active nonhealing stage of rickets.

The following charts (see Charts IV and V) and roentgenograms (see IV and V) give in detail the data as recorded on admission and during the periods of study regarding diet, therapy, weight, and findings in the blood serum and in the x-ray.

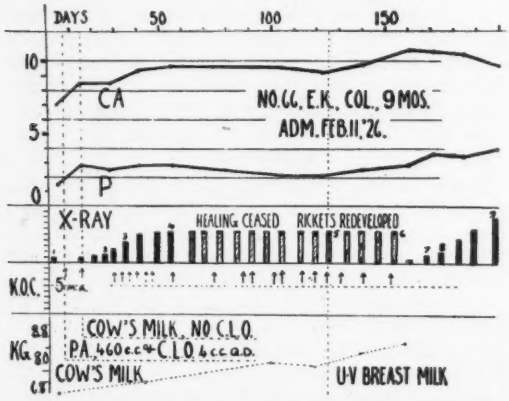
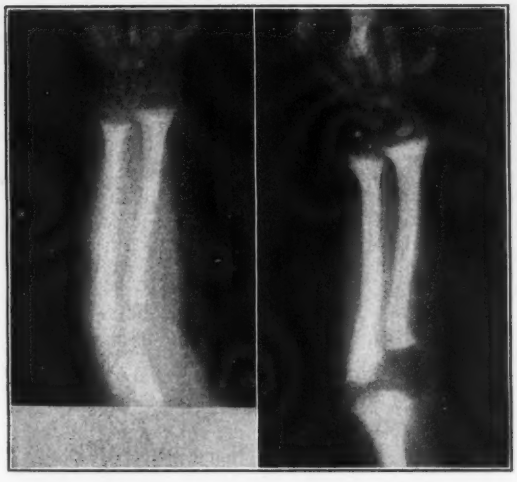


Chart IV—Patient, E. K. Roentgenogram showed healing on admission which continued for about sixty days. Received a small amount of protein S. M. A. and cod-liver oil for a few days after admission. After healing changes had ceased, rickets redeveloped. Then patient was given daily 1000 cc. of human milk from mothers who were given daily exposures to ultra-violet rays. In order to be certain of a satisfactory caloric intake, 50 grams of Borcherdt's malt soup extract and 25 grams of flour were added to the diet. Healing changes were seen in the roentgenogram after thirty-two days on this diet. Healing was almost complete in ten to twelve weeks.



X-ray IV-a

X-ray IV-b

Roentgenogram IV-a—Patient, E. K. Taken after all healing seen on admission had ceased and just before ultra-violet breast milk was started. This roentgenogram is designated as No. 5 on Chart IV.

Roentgenogram IV-b—Patient, E. K. Taken after sixty days of human milk from mothers exposed to ultra-violet rays. Shows decided healing. First improvement was noted on the thirty-second day. This roentgenogram is designated as No. 9 in Chart IV.

Roentgenograms IV (a-b)—Patient, E. K. Compare with Chart IV. These roentgenograms show: first, active nonhealing rickets; second, the effectiveness of human milk from mothers exposed to ultra-violet rays.

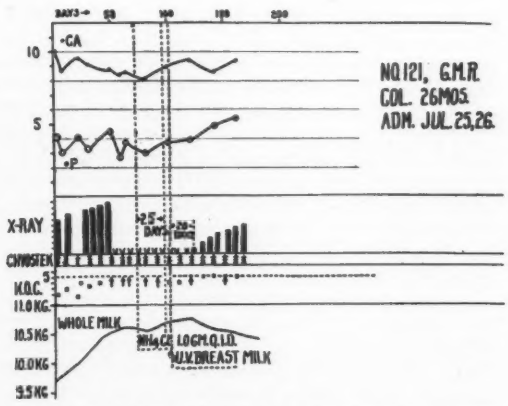


Chart V—Patient, G. M. R. Roentgenogram showed healing on admission which continued for about fifty days. After healing changes had ceased active rickets redeveloped. Then patient was given daily 750 cc. of human milk from mothers who were given daily exposures to ultra-violet rays. In order to be certain of a satisfactory protein, mineral and caloric intake was given in addition, 250 cc. of skim milk, 75 grams of Borcherdt's malt soup extract, and 25 grams of flour. Healing changes were seen after twenty days on this diet. Healing was continuous to the end of the observation or for about sixty days.

X-ray V-a

X-ray V-b

Roentgenogram V-a—Patient, G. M. R. Taken fifty days after cessation of the healing seen on admission. During this period the patient received whole cows' milk. Shows active nonhealing rickets.

Roentgenogram V-b—Patient, G. M. R. Taken after sixty days on human milk from mothers exposed to ultra-violet rays. Shows definite healing. First improvement was noted on the twentieth day.

Roentgenograms V (a-b)—Patient, G. M. R. Compare with Chart V. These roentgenograms show: first, active nonhealing rickets; second, the effectiveness of human milk from mothers exposed to ultra-violet rays.

It is evident from these findings that human milk obtained from mothers whose bodies have been exposed to the rays of the quartz mercury vapor arc lamp possesses antirachitic qualities that are adequate to cure in human infants a rickets in its active nonhealing form. Our results, therefore, confirm those obtained by A. F. Hess and his coworkers in curing rickets in rats with human milk from irradiated mothers.

There is, then, an enormous difference between the antirachitic efficacy of human milk produced by mothers receiving in addition to an adequate general diet a tablespoonful of cod-liver oil and that ob-

tained from mothers whose bodies have been exposed to the ultra-violet rays. The human milk obtained from our cod-liver-oil-fed mothers, as well as that obtained by Hess from the mother before exposure to the quartz lamp, showed no therapeutic properties against rickets, whereas, the human milk produced by the mothers exposed to the rays did. The latter gave evidence of its healing power on the thirty-second and twentieth days of treatment, whereas, the former showed no potency within fifty-one, sixty-three, and sixty-eight days. It should be remembered, however, that the intensity of the actinic rays produced by the mercury vapor arc lamp is considered to be thirty times as great as that of sunlight, and that the mother who produced the milk for Hess and his coworkers was very liberally exposed to these rays, inasmuch as the lamp was placed at a distance of thirty inches for four minutes or more for the first four treatments and thereafter at sixty inches for fifty-six minutes. The wet-nurses used by us were exposed less vigorously as we followed, with slight alterations, the schedule suggested by Huldschinsky for the treatment of rickets.

From our observations it is clear that human milk produced by mothers during the winter months in the northern parts of the country when sunshine is practically absent and cold and inclement weather often is present, cannot possess antirachitic properties of any account. And whether human milk becomes anti-rachitic during the summer months and to what degree is still a question. That by exposing the skin of the human mother to the sun one can produce an antirachitic milk may surely be assumed on the basis of results obtained by Hess and ourselves with the use of the quartz lamp. But whether the time required for an adequate exposure is observed by our mothers as they work, dress and live today is not known.

We hope to get an answer to this question during the coming months. Whatever the answer to this question may be, the evidence at hand today places the actinic rays in the position of first importance in the prevention and cure of rickets in growing human infants. In other words, the combination of actinic rays and skin rather than that of diet and gastrointestinal tract is primarily nature's method to protect the human infant against rickets either through the skin of the offspring or through that of its mother or both.

CONCLUSIONS

1. Human milk obtained from mothers receiving in addition to a satisfactory general diet one tablespoonful of cod-liver oil daily failed to give any evidence of possessing antirachitic properties when fed to three cases of active nonhealing rickets for periods of 33, 45 and 36 days, and within observation periods of 51, 63 and 68 days. These same infants, however, showed signs of healing both in the blood serum and in the roentgenogram within 29, 20 and 32 days of feeding of food mixtures* containing 2.2 or 3.5 cc. of cod-liver oil per liter.

2. Human milk obtained from mothers who were exposed to artificially produced actinic rays gave evidence of possessing definite antirachitic properties in two cases of active nonhealing rickets at the twentieth and thirty-second days of feeding. The degree of healing at the end of sixty days of feeding was not quite as marked as is that usually observed by us after treatment of the infant itself with actinic rays or after the giving of food mixtures containing 2.2 or 3.5 cc. of cod-liver oil per liter.

3. It is suggested that the combination of actinic rays and skin rather than that of diet and gastrointestinal tract is primarily and fundamentally nature's method of protecting the human infant against rickets, and that, therefore, rickets is primarily a climatic rather than a dietetic disorder.

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*Protein S. M. A. and S. M. A.

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THE COMPARATIVE CONTRIBUTIONS OF LISTER AND OSLER*

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IT may seem strange that a layman, one who has had no connection with the profession of medicine or surgery, should be given the honor of a part in these proceedings. Yet it is not altogether strange, for Lord Lister was far more than a surgeon. He was more than the founder of modern surgery. He is entitled to be called one of the founders of modern civilization. For the whole fabric that we call civilization rests upon the preservation of human life and the increase of human efficiency. He who increases the span of human life has a right to be numbered among the great, for he makes the whole world his debtor. That is why the life and work of Lister intrigue the interest, not of the medical profession alone, but the interest and admiration of the scientist, the historian, the economist, and indeed the interest of everyone whose function it is to study the progress of the social order. That is likewise my apology for venturing to address you this evening on a theme which might seem to be far out of my own province, but which in reality is not. Lister's work inured to the advantage of all mankind.

I fear that we are too much given to the habit of studying genius in isolation. We are prone to forget that the work of a pioneer in any profession exerts an influence far outside the immediate boun-

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daries of his own discoveries, for every field of human knowledge is interwoven with every other. Progress in surgery is progress in science, and progress in science is progress in civilization. The advance in all fields must go hand in hand; it cannot be achieved in one without influencing the others, and it is by this mutual helpfulness that the integration of all knowledge is secured. You will understand me, therefore, when I speak of Lister as a maker of history, a contributor to economic welfare, and a man whose genius augmented the productive power of his fellow-men.

For the work which Lord Lister was destined to perform, he came into the world at an opportune moment. He was born in 1827, at a time when the great movement known as the Industrial Revolution was transforming the conditions of life in Great Britain. The utilization of steam power was rapidly changing the conditions of industry a hundred years ago. Great factories were springing up all over England, with new and strange machines harnessed to boilers and furnaces; machines that were wholly unguarded against the possibility of accidents to the workers, and with great bodies of employees (especially women and children) working long shifts under fatiguing conditions. Women and children were frequently required to work a ten-hour shift through the night, under the poorest artificial light, tending machines that would have been hazardous under even the best conditions. The result was that accidents happened with appalling frequency and they were always fraught with serious consequences, for infection and suppuration were the regular concomitants of even minor wounds. How great a toll of life these accidents took may be gleaned from the fact that of 2098 recorded amputations in the hospitals of London, Glasgow, and Edinburgh, no fewer than 855 had fatal results, or two in every five. And these amputations included a great many that would now be called minor operations.

It is difficult for us to realize the amazing backwardness of the science of surgery at the time of Lister's birth a century ago. It has been estimated that of the operations upon wounded soldiers during the Napoleonic wars, more than 80 per cent had a fatal outcome. Surgery was not then a science, in any sense of the term, but a crude art based chiefly upon superstition. Early in the seventeenth century William Harvey had discovered the circulation of the blood. Before the end of that same century Antony van Leuwenhoek saw and described the organisms which we now know to have been bacteria; but he had no intimation of their significance, and his discovery was therefore of very little scientific consequence. Finally, in 1796, Jenner discovered the art of vaccination against smallpox, which was the first specific prophylaxis ever devised by man. These three discoveries of Harvey, Van Leuwenhoek, and Jenner were the only outstanding contributions that had been made to the progress of medicine and surgery for twenty centuries preceding the date of Lister's birth.

Yet how marvelous was the rapidity of progress in these fields during the eighty-five years of Lister's life! While still a young man, only 33 years of age, Lister witnessed the incoming of the germ theory at the hands of Pasteur; for in 1860 this French scientist established the fact that decay and fermentation result from the growth of microorganisms. Ten years later, in 1870, Lister himself gave the world its first conclusive demonstration of the fact that the suppuration of wounds and hospital gangrene were caused by this same phenomenon, namely, by the ingress and multiplication of those minute organisms which we now call pathogenic bacilli. Lister was greatly helped by Pasteur's discovery, for it corroborated a line of thought which had been running in his own mind. Might there not be an identity of causation between the process of organic putrefaction and the breaking down of the tissues in the human body? So he set quietly to work on this line of investigation. If the suppuration of a wound was caused by microbes, how could these microorganisms be destroyed? Strangely enough, Lister got his first useful hint toward a solution of this problem from the sanitary officers of an English city who were conducting experiments in the deodorizing of sewage. These investigators had found that the intolerable odor of stagnant sewage could be overcome by dosing it with carbolic acid. Lister went to see the process and, recalling Pasteur's demonstration, at once concluded that carbolic acid was a successful deodorant, for the simple reason that it destroyed the bacteria which were responsible for both the putrefaction and the odor. This opened up the whole vista to him. Thereafter it was only a matter of perfecting an antiseptic for the cleansing of wounds, and devising some practicable method for safeguarding wounds against new infection.

It is an old saying that chance comes only to the minds that are prepared to welcome it. There were thousands of surgeons who had read and understood all about Pasteur's discovery. There were also thousands who knew that certain chemicals, notably carbolic acid, could be used to eliminate the odors of putrefaction. But there was only one among all those thousands who had the genius to link these two things together into a single train of thought.

How amazing, after all, is the slowness of the average human mind in putting two and two together! The ancient Romans, for example, knew a great deal about malaria, for it was the scourge of the country round about the Eternal City. They knew that it was a communicable disease, that it could be carried from one person to another; they knew that it was peculiarly a disease of people living in low, marshy regions, and they were convinced that those who went abroad after sundown were particularly susceptible to malarial infection, hence they spoke of it as "the pestilence that walketh by night." In a word, if they had put all their information into an orderly and logical array there would have been no escape from the conclusion that malaria was communicated from person to person by something that thrives in swampy lands, by something that is especially in evidence during the hours when the sun is low in the heavens, by something that does not frequent, at midday, the dusty thoroughfares of a busy metropolis. The only possible answer to this conundrum would have pointed

directly to the mosquito; but not for 1500 years after the fall of Rome was any human mind ingenious enough to designate the *anopheles* as the insect that fulfilled all these specifications.

The same long interval between knowledge and the practical application of knowledge has characterized many other fields of human progress. Take the art of printing, for example. Coins are print, and the Romans had mastered the art of stamping coinage. They had seals for stamping on wax. They carved signatures on wooden blocks. All this would seem to suggest to any ingenious mind the idea of carving each letter of the alphabet separately and using them to replace the drudgery of copying whole books by hand. Yet that simple step forward was not taken for more than a thousand years.

Or, to take another illustration, and an even simpler one, the ancients were familiar with steam. They had seen water heated, and steam force its way out of closed receptacles; they could not fail to observe that here was potential energy being created; yet the world had to wait more than twenty centuries before the ingenuity of James Watt turned this energy to the service of man and thereby started a revolution in the methods of industry. What a long interval of time it has often required to carry a principle from one step to another!

And so, if Lister had not taken Pasteur's theory of the cause of organic putrefaction and applied it with intelligence and industry to his experiments in the conquest of surgical infections—if he had not done this, we have no assurance that it would have been done by anyone else in his generation. Like all other pioneers, he had to overcome all manner of skepticism, and even hostility, but he was quite oblivious to both. Indeed the history of science does not carry on its pages any investigator of greater pertinacity in his pursuit of truth. It took Lister more than twenty years to convince the world that bodily wounds are not self-infective, that the vitality of the human frame can repair injured tissues if given a fair opportunity, and that this opportunity could only be afforded by the processes of aseptic surgery. But he never wavered in his convictions, and in the end he made the truth prevail. As a benefactor of the human race there are few whose claims to immortality and to the enduring gratitude of his fellow-men are greater than his, for modern surgery has secured to us a diminution of bodily suffering and a resultant economic gain which are far beyond the power of any man to estimate.

Lister lived through an age of great scientists. He was a contemporary of Humboldt, Darwin, Lyell, Pasteur, Kelvin, Herbert Spencer, Helmholtz, and Osler—men whose discoveries compelled a complete recasting of ideas and methods in all the fields of science. There had never been such a galaxy of contemporary scientists before. We are accustomed to speak of the Victorian age—the middecades of the nineteenth century—as an epoch that was conventional, complacent, and turgid in its habits of thought; yet as we look back upon it in an objective way, what a great and brilliant epoch it was! The age which we somewhat contemptuously call Victorian, despite its formalism in social organization and manners, will go down in history as one of the great ages; a period that was replete with epoch-making discoveries in one field after another; an age that gave the minds of men wholly new orientation in science, in philosophy, in religion, in literature; and, not least by any means, an era in which our progress in the conquest of disease made greater progress than in all the centuries preceding.

In this battle for the mastering of human ailments, four names stand out pre-eminent, from the layman's point of view—Pasteur, Lister, Koch, and Osler. Two of them, Lister and Osler, were men of Saxon inheritance; they spoke and wrote in the English tongue; they worked with equal success in different but closely related fields; they used different methods but with the same quiet perseverance, and history has given them a common fame.

It is interesting to compare the careers of these two men who rose to the very pinnacle of their respective professions. Lister was born in one of the suburbs of London, the child of well-to-do parents. Osler was 22 years his junior, the son of a struggling clergyman in a small Canadian village. They started life far apart, both geographically and in point of opportunity, but time and success ultimately brought them close together, Lister in London and Osler at Oxford. The two were alike in possessing minds of the inquiring type, and both acquired a fine, broad background of cultural education in addition to the more specialized professional training. Lister was a philosopher by temperament; it was his habit to relate all phenomena to great underlying principles. The central thought in all his work was the principle of inherent human vitality, the vitality of the human organism, its ability to win battles against disease whenever the odds were not too heavily adverse. Hence his experiments were all motivated by the same fundamental aim; to build up vitality, to conserve it, to protect it against breakdown. Thus a philosophy of life and its preservation guided Lister in all that he did.

Osler had less philosophy in his makeup, but he had a more vivid and a finer imagination. If Sir William Osler had not chosen to be a great clinician and the writer of the world's most admirable textbook on the practice of modern medicine, he would have won high distinction as an essayist, a historian, or a critic of literature. He possessed a fine literary sense, and it was highly developed by the excellent mastery of the classical languages which he acquired in college days. Osler never wrote anything, even of the most technical character, that was not good literature. The minutiae of diagnosis is hardly a subject that naturally lends itself to limpid writing, but Osler made it so. He wrote with a clarity that stands unsurpassed in the whole range of scientific writing and gave to even the most arid phases of his subject a freshness of presentation that served to captivate the fraternity of medicine throughout the English-speaking world. Surgeon and philosopher, physician and man of letters, these two distinguished knights of the modern chivalry bore testimony to the value of the English classical education.

Lister and Osler were alike in the strictly scientific technique which they used, yet their methods

were quite dissimilar. Lister, as a surgeon, was in the nature of things impelled to use the method of controlled experiment. He made literally thousands of experiments before attaining the perfection of the sterile gauze that is now in use the world over. Osler, as a physician, and more particularly as a student of diagnosis, was an observer rather than an experimentalist. With unremitting industry, he worked on the records of many thousand cases, assembling the main facts, tabulating them, reducing them to a common denominator, and then weaving them together into an enlightening narrative. No one has ever used the deductive method more skilfully or to better advantage than Osler did. He was imaginative, it is true, but he never let imagination interfere with the strictly scientific character of his work. With equal facility he could discuss the major symptoms of typhoid, or translate the Odes of Horace. It is now thirty-six years since Osler wrote his textbook on the principles and practice of medicine, yet even today the book has not been superseded. Seldom is it given to any work of science to hold its place of primacy so long.

It is said that among the two billion persons who inhabited this planet during the course of the nineteenth century, not more than one person in a thousand set the slightest imprint upon it. The other 999 left the world just as they found it, without having added one jot or tittle to its stock of knowledge and without having contributed a single idea that was worthy to live. The torch of progress has always been borne aloft by the very few, by those all-too-rare pursuers of the truth whose industry kindles the spark of genius into flame. It is to them that we owe all the great contributions that science has made to the comfort, happiness, and prosperity of our common race.

The advance that has been made in medicine and in surgery, in hygiene and in sanitation, in protecting the public health, in controlling the major routes of infection, and in building up the physical vigor of the people—this advance has been one of the mightiest achievements of modern civilization, quite worthy to be ranked with things that border on the miraculous. And who are they who have wrought all this? Certainly not the toilers in the fields and in the factories, to whose efforts we are so often assured that all wealth and progress are due. First and last it has been the work of highly trained specialists, using the methods of scientific experimentation in the laboratories of hospitals, medical schools, and other institutions of research. And if this remarkable advance, which is steadily prolonging the days of men's lives, is to be continued, it can be continued in no other way. As a nation we have not been ungenerous in our encouragement of scientific research, yet when we consider the immense wealth of the United States, the amount of money devoted to research in the field of public health is pitifully small. And so, as we pay tribute here tonight to the genius of Lister, one of the great benefactors of humanity, let us not forget that the work which he began is by no means finished. Despite all the progress that has been made during the past century, disease still has its mysteries. There are ailments which still defy the skill and ingenuity of man. Let us not rest until we have conquered all of them, for there is no better way of honoring a man's memory than to finish the work that he began.

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THE GOITER PROBLEM*

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TO appreciate fully the wonderful strides that have been made in medicine and surgery in this modern era, one needs but turn a brief page backward in the annals of history and read. From the epoch which produced Shakespeare and Galileo, and Sir Isaac Newton in rapid succession, we get a sideline on the medical and surgical problems of the seventeenth century in the classic diary of old Sam Pepys. This distinguished character in English public affairs carried with him always a rabbit's foot to keep away the colic. But the real cause of his pain was stone in the bladder, for which he was operated by an itinerant lithotomist. This was such a tremendous event in his life that he had a jeweled casket made in which to keep the stone, and each year he celebrated the anniversary of the date with great pomp and ceremony.

It is a long hark in experience and development, though comparatively short in years, since the chaos of the days of Shakespeare. But most of that development has been within the last half century.

One of the most dramatic chapters of the history of medicine and surgery centers around the goiter problem. The great physicians and surgeons of the immediate past were baffled and overawed before a situation in which we now have understanding and perfect confidence. Thyroidectomy was thought to be an unjustifiable operation by men of the very highest standing in the generation immediately preceding to ours. Thus in 1866 we find Samuel D. Gross as quoted by Pemberton, saying, "When the tumor resists our curative efforts and endangers suffocation, it has been proposed to afford relief by extirpation, but the question arises, is such a procedure proper or justifiable? In a word, can the thyroid gland when in a state of enlargement be removed with a reasonable hope of saving the patient? Experience emphatically answers no. No honest and sensible surgeon, it seems to me, would ever engage in it." The goiter problem is interesting because of its correlation to so many other problems in the world. Geology has a bearing on it because of the deposition of iodin in certain of the rocks; geography has a bearing on it because of the great sections of the terrain in which it prevails; chemistry has a bearing on it because of the physiological bearing of the normal and abnormal products of the thyroid gland; endocrinology has an important bearing on it because we are getting glimpses of a counterbalance in the physiological processes exercised by the products of the ductless glands of which the thyroid is one of the most important.

Much is yet to be learned about the pathological background of the thyroid diseases. We are still entirely in the dark about the causes which produce

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the hyperplasia in exophthalmic goiter, and their relationship to the ordinary toxic and nontoxic adenomata. Our present conception of the genesis of goiter is something like this. Nature builds secreting epithelium into the acini of the ductless thyroid gland, much as the mason builds cobblestones into the curbing of the wall. Some cobblestones are left over, and remain loosely distributed about the works. Hypothetically, part of the thyroid epithelium has the function of working up iodin into thyroxin, and part of it has the function of producing colloid material to hold the iodin, both in the raw and the finished state, in suspension. Iodin is hot stuff, and it must have a vehicle to diminish its irritation to the tissues, just as we use a vehicle to dilute drugs for therapeutic use. The average-sized body requires about fourteen miligrams of thyroxin distributed throughout the tissues to keep its metabolism up to standard. No doubt the colloid of the thyroid serves as a reservoir for this finished product to distribute it out as required, just as the liver stores glycogen to dole out to the muscles. That an iodin deficiency is the cause of goiter is a hypothesis that explains some, but not all of the facts in the case. The work of Kimball and Marine in the Ohio schools seemed to demonstrate that growing boys and girls can be protected from goiter by small amounts of iodin taken internally at stated intervals. We can imagine that the epithelium of the thyroid acini take on a hypertrophy or a hyperplasia in their attempt to meet the demand of the body when an iodin deficiency hampers their work. We can imagine also that the islands of disconnected epithelium, which lie in the stroma, like the extra cobblestones in building the well curb, may take on the same hypertrophy, and produce the nodules of adenomatous goiter. Just how to connect up exophthalmic goiter with this scheme is not so easy. The intangible something which is back of the widespread, and often rapid hyperplasia of this disease has not as yet been explained. Criles' idea of an accumulating emotional cause, which harks back to our ancestry, seems to me very far from the truth. That there is an inflammatory process mixed up in this syndrome has always seemed likely to me, because we almost invariably find adhesions between the neck muscles and the capsule of the gland when we operate on these cases. Adhesions in any other part of the anatomy are always interpreted to be of the inflammatory origin. The increased vascularity may also in part have the same significance. It may yet turn out that there is a specific organism back of exophthalmic goiter. The fact that it has intermissions, and sometimes remissions, points strongly to this hypothesis. The body may establish a temporary, and sometimes a permanent immunity against an unknown organism invading the thyroid gland.

SYMPTOMATOLOGY

The classification of goiter into colloid, adenomatous, and hyperplastic is the simplest and most useful classification. That there is an overlapping of these types into one another is apparent to anybody who has given the least attention to the pathology. Thus when the colloid material shrinks under treatment, islands of adenomatous goiter may appear, and when toxic adenomatous thyroids are removed the pathologist may find the hyperplasia of exophthalmic goiter in the same specimen. These facts have a practical bearing on our therapeutic measures. The widespread examination of school children we have had in our state, following the lines of similar investigations elsewhere, took as its postulate the position that the normal thyroid cannot be palpated through the neck tissues. I am not by any means satisfied that this is true. Judging by other structures in the body, one would expect considerable variation in size within normal limits in the thyroid. Some necks are also much thinner than others by nature, and this would make the thyroid more easily palpable. To determine the line of demarcation between the normal and the pathological thyroid by palpation would be impossible in a great many cases. Those high percentages of goiter incidence in school children given out by the examining boards were probably very misleading. So far as I know there have been no such examinations of school children in sections where goiter is not prevalent. If we had such data it would be highly useful in arriving at a conclusion as to the pathological bearing of the slightly enlarged thyroid. As cases present themselves to us for treatment, the fact that a goiter is present is obvious at a glance in the great majority. The pertinent question for us to decide is whether the goiter is toxic or nontoxic. Here basal metabolism estimation has come to our aid with a great deal of significance. But I think its usefulness is limited largely to the doubtful cases. Where a case is obviously and unquestionably toxic, basal metabolism estimation can add but little to our knowledge, but it adds considerably to the expense of an already expensive study. I attach but very little significance to it as an indicator for the safety of an operation, or to the extent of the operative procedure to be carried out at one sitting. Other symptoms are much more significant. The modern clinical study, with all our aids and abetments, has become so expensive that there is a need for curtailment wherever possible when dealing with the masses. When we are dealing with wealthy patrons, of course this does not hold. Scientific methods may become so all-searching that they go far beyond the financial possibilities of our patient. And again we may get into the habit of depending so much upon laboratory reports that we forget the tremendous significance of the simple direct clinical story, which we can draw by symptoms and signs first hand from the patient. Our most perplexing problem in dealing with goiter patients centers around toxicity of the doubtful case. When a patient has part, but not all of the syndrome and basal metabolism estimations are not accentuated, we may be in serious doubt as to the proper therapeutic procedure. If we refused to operate on all such cases we would miss some in which the results are very gratifying. On the other hand if we operate on a neurotic patient who has no hyperthyroidism, by removal of the thyroid we are apt to do considerable harm, and to add to our list another vexatious problem for the future. In these uncertain cases basal metabolism is our most reliable guide, but the judgment of the surgeon of expe-

rience in each particular case must be the determining factor.

TREATMENT

The treatment with iodin both for prevention and cure of simple goiter seems to be on a sound foundation. After the work of Kimball and Marine with the school children in Ohio, and the similar work done in the schools of Switzerland, there should be no doubt of the propriety of carrying out a prophylactic program in the schools of all goiter districts. But we fail for the most part to follow up this most important lead. The thing is so simple and easy that we are like the leper whom the prophet told to go and bathe in the Jordan for the cure of his malady and he would not believe because the thing was so easy. The experiments of David Marine have demonstrated that the amount of iodin required to make up the deficiency is exceedingly small. Ten milligrams once a week seems ample. McCarrison gives statistics to show that 5 per cent of children born of goitrous mothers will be cretin imbeciles, and Marine demonstrated that small amounts of iodin added to the dietary of pregnant animals will prevent cretinism in the offspring almost without fail. This would argue for the use of small amounts of iodin routine with pregnant women, and this should be particularly emphasized in the goiter districts. It has been my experience, and I believe others have found the same thing true, that desiccated thyroid is much more effectual as a curative for adolescent goiter than the iodin salts. We need to remember too that the treatment will be necessary for a considerable period of time before we can see results. Often after months of medication without apparent improvement the goiter will begin to diminish, and will disappear in a few days. I believe the age limit for the use of iodin for the cure of goiter, should not exceed the twenty-fifth year, and not infrequently hyperthyroidism will be induced in patients younger than this. The goiter patient who is older than 25 years must decide either to have it treated surgically or left alone. Many of these simple goiters will become toxic in due course of time, and this is particularly true of the thyroid adenomas. The safety with which they can be removed by competent surgeons is a strong argument for their removal, and if we add to the probability of the development of hyperthyroidism, the danger of substernal extension, and the possibility of malignant change, the argument becomes more emphatic.

It is doubtful whether thyroid adenomata, even in young girls, ever clear up with iodin treatment.

There is no longer any question of the propriety of treating toxic goiter surgically. The operation in competent hands has become safer than most of our major surgical procedures, and the results are in general most gratifying. To see a patient who is an emaciated, woebegone, nervous wreck, transformed in a few weeks into a glowing picture of health and efficiency is a sight to cheer any heart, and this is what you can reckon on in the great majority of these cases. Much has been written about the operation, but there are some points I would like to stress as of particular importance. Everybody agrees with the initial use of Lugol. I very seldom do any initial ligations. I much prefer in all cases to do the excision first hand, resting the patient at any stage of the game until the viability comes back to the point of safety, and then going on to the finish. In all bad toxic cases I have a competent internist associated to watch the blood pressure and the general condition throughout the operation, and to give early warning when shock is developing so that the operative procedure can be intermitted. I use a combination of light gas anesthesia with ½ per cent novocaine locally. The very vascular goiter is unfortunately associated with the most toxic condition. Dense adhesions between gland and muscle are common in these bad cases. To see tissues welling out blood in an avalanche when they are so friable that hemostates only break crumbling masses away, and make the matter worse, is a sight to try the strongest heart.

In this type of case I have great help from an old type of forceps known as Mesu forceps, and formerly used by the gynecologists in hysterectomy. This instrument has a very broad blade with hooks at the end, and it compresses large areas of the tissue, and holds fast. Quickly separating the muscles, and lifting the gland from its bed, I apply one or more of these Mesu forceps and the bleeding is so effectually controlled that the excision can be done deliberately. By the aid of this instrument one soon becomes master of the situation. This is the best thing that has come to me in years.

As to the amount of tissue to remove in the exophthalmic case, you can hardly take too much if you leave the posterior sheath and a thin layer. The only hypo cases I have seen are those where you get suppuration.

In those cases where the adenomatous tissue is diffuse, and not collected into masses, one cannot go to the limit one can in the exophthalmic case. Enough of this damaged gland must be left to elaborate the necessary amount of thyroxin. There will be a recurrence in a certain number of these cases, regardless of the amount you remove. Fortunately that number is small, and we still have the resource of subsequent operation at our disposal. To prevent secondary hemorrhage I place all my ligatures that go into the gland proper with a round needle, being careful not to dip deep enough to endanger nerve or parathyroid. By the use of the figure-of-eight suture, considerable sized blocks of the gland can be included, and much time saved. Besides there is no danger of a suture slipping when it is so tied into the tissues. In those trying cases where a lateral vein breaks off during the process of elevating the gland I pack the side quickly with pads of gauze, and leave it until I have everything else out of the way and the field all clear. Then by the use of proper retractors I get a good exposure and pick up the vein. One can ligate the internal jugular when driven to the necessity of it, but it is a good thing to avoid. Iodiform gauze packs can be used when there is an oozing which does not lend itself to suture, but one needs to be careful when it is removed or a secondary hemorrhage may be lighted up.

The postoperative treatment is largely expectant, though experience has shown that large amounts

that there is a potential hypoglycemia in a considerof fluid are of great value. It is our observation able number of cases, and the results of intravenous glucose have been most gratifying. In the exophthalmic case, where there is a recurrence, and symptoms begin to develop again, I waste no time with expectant treatment, but straightway remove the offending hyperplastic tissue. If enough is removed the relief of symptoms will be quite as prompt and satisfactory as in the primary operation.

I remove the drainage tube in twenty-four hours, and all the skin sutures at the end of three days.

If the skin adheres to the trachea, which it does in a certain number of cases, it is sufficient to follow the old line of incision and dissect upward and downward until the trachea moves on swallowing without pulling on the skin.

Such adhesions will not reform if the dissection is carefully done.

Intermountain Clinic.

KETOGENIC DIETS FOR EPILEPTICS *

By D. SCHUYLER PULFORD, M. D.

Woodland

DISCUSSION *by Albert H. Rowe, M. D., Oakland; J. Wilson Shiels, M. D., San Francisco; Arthur E. Mark, M. D., Los Angeles; W. D. Sansum, M. D., Santa Barbara; James W. Sherrill, M. D., La Jolla, San Diego.*

INTRODUCTION: Epilepsy constitutes an important public health and eugenics problem. Conservative estimates by those in a position to know indicate that there are one-half million epileptics in the United States or that one person in every 250 of our population is thus afflicted. It is therefore the duty of the medical profession, realizing this fact, to do all in its power to apply and see applied any improvement in the treatment of this disease, to encourage investigators to discover its origin and even to lend support to the enforcement of any sane procedure in prevention. By prevention I refer to the firm and mathematical working of the laws of heredity. Should we not accept the unpleasant facts so emphatically substantiated by the work of Maude Slye,[1] among others, with spontaneous tumors of mice, and enforce upon the lay mind the dangers of transmitting to offspring even this recessive unit character?

Most medical subjects in the last few years have been illuminated by a rapidly increasing knowledge in great part due to the clinical laboratory, the chemist, or the physicist. However, we must admit that as yet the cause of epilepsy is still obscure and its treatment, until recently, little advanced.

Therapy has been dictated by views of origin which have been chiefly, as follows:

1. Degenerative disorder of the nervous system.
2. Toxic, as from foci of infection or from poisons.
3. Dysfunction of endocrines.
4. Derangement of metabolism.

Elimination of foci of infection and administration of products of the glands of internal secretion have proven valuable adjuncts to diet treatment. Pituitary extract has proven helpful in certain cases. No degenerative disorder has been found in so-called essential or idiopathic epilepsy. So the problem of treatment remains one of régime, medicines, and metabolism.

Before advancing along our main line of attack, i. e., diet therapy, let us hold clearly in mind that certain cases of epilepsy are inherently milder than others, that there are organic as well as functional epileptics, and that these differences should be recognized before interpreting response to treatment.

The object of this paper is to emphasize a simple, accurate method of writing individual ketogenic, i. e., acid forming, diet prescriptions for epileptics from Du Bois' normal basal calorie tables, Wilder's nomographic chart of the same, certain ketosis fat formulae, and Talbot's basal metabolism charts for children under 10 years of age. A discussion of the factors involved in this treatment sounds highly scientific. As a matter of fact both the principle and the method are simple. Two to three weeks hospital observation while the individual diet is to be ascertained, though not necessary, is advisable. The patient then returns home to the care of his family physician, who can continue the treatment effectively.

Priority of fasting as a treatment of epilepsy must be given to Grulpa [2] and Marie, who in 1910 applied their diabetic starvation régime to epileptics. Their claims are indefinite and details are lacking. Zeller,[3] Wilder,[4] Geyelin,[5] Shaffer,[6] Ladd and Palmer,[7] Osborne and Mendel,[8] and others have helped in planning safe ketogenic diets, while Wilder[9] and Winters, Weeks [10] and his coworkers and Peterman [11] have shown results of such diets applied.

Wilder in 1917 showed by intravenous injection of aceto-acetic acid into dogs that if they were receiving adequate carbohydrate intake, the aceto-acetic acid was promptly and completely converted into betahydroxybutyric acid, thereby showing the necessity of carbohydrate restriction in securing sufficient accumulation of aceto-acetic acid for its anesthetic effect. In fact he found carbohydrate restriction the only practical method of securing this effect. Geyelin in 1921 had reported favorable results in prolonged fasting in the treatment of epilepsy. Shaffer (1921) in a series of publications on antiketogenesis concluded a 1:1 molecular ratio of antiketogenic to ketogenic molecules to be the balance in man. He later agreed, however, with other workers that "each molecule of glucose is ketolytic for two molecules of aceto-acetic acid," i. e., that the ratio of fat to glucose formers was really 2:1.

Wilder and Winters (1922) defined the threshold of ketogenesis as "that ratio at which ketosis first appears on a diet with a disproportion of fat to glucose formers." They showed by careful metabolic studies on sixteen patients (thirteen diabetic and three epileptic) that the "ratio of ketogenic and glucose molecules at which a clinically significant ketosis appears has a value of at least 2:1, i. e., every molecule of glucose is ketolytic for two molecules of aceto-acetic acid."

Ladd and Palmer (1923) report a ketogenic anti-

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* Read before the General Medicine Section, California Medical Association, at the Fifty-Fifth Annual Session, April 26 to May 1, 1926.

ketogenic ratio in terms of grams showing that clinically a 4:1 ratio is necessary for ketosis. This formula takes no account of the antiketogenic glycerol content of fat or the ketogenic derivatives of proteid.

Osborne and Mendel (1924) have shown that nutrition and growth are undisturbed in rats on diets highly deficient or entirely lacking in preformed carbohydrate. Also that on high protein, low carbohydrate, low fat diets, growth is good, but not equal to that on a high protein, high fat, low carbohydrate diet. The interesting part of their experiments to us is that with low protein, extremely low carbohydrate but a high fat diet, animals prospered until eight-tenths to nine-tenths of the caloric intake was fat. In rats even a ratio of 7 grams of fat to 1 gram of carbohydrate plus protein was well tolerated.

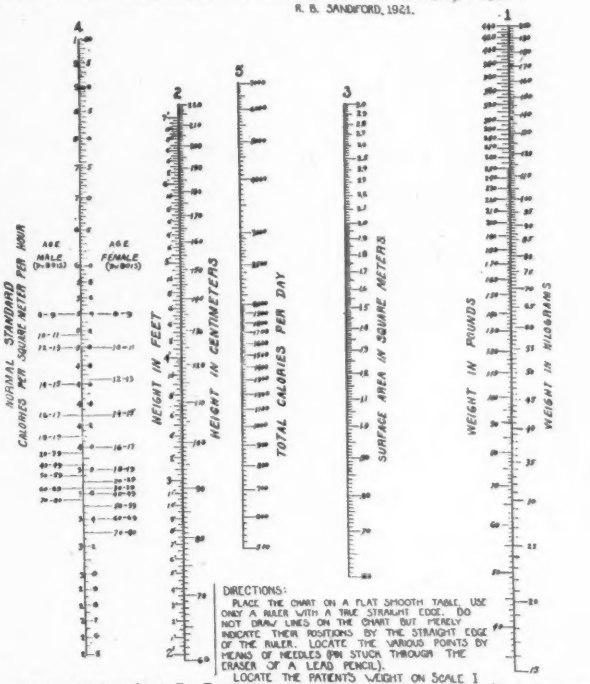
About five years ago (1921) Wilder suggested that diets low in carbohydrates and proteins and high in fat might through accumulation of aceto-acetic acid and its by-products, betahydroxybutyric acid and acetone, surpass in effectiveness fasting procedures in the treatment of epilepsy, and he proposed the scheme now in vogue for that diet.

Weeks and his coworkers (1923) treated six adult epileptics of long standing with high-fat diets. The experiment lasted only thirty-four days. The total calories exceeded the metabolic requirement during the last ten days. Fat was varied between 250 and 580 grams, protein between 15 and 22, carbohydrate between 2.5 and 3.7 grams a day. Acidosis was surprisingly slight and no improvement was noted. It is probable that a higher grade of ketosis was not observed because the 10 per cent glycerol content of the large amount of fat fed in some way changed the ketogenic-antiketogenic molecular ratio. This group of patients showed evidence of mental degeneration.

The reports of Peterman (1924-25) focussed the attention of doctors throughout the country upon this subject, because of the brilliant results obtained in his series of cases in the pediatric department of the Mayo Clinic. His patients were all under 15 years of age, the youngest being 2¼ years. Of thirty-seven cases treated nineteen were free from attacks, eight of these from 1 to 2½ years. In thirteen the number and severity of attacks was reduced and in only one was there no improvement.

The Ketogenic Diet—As described by Peterman consists of a large amount of fat with minimal amounts of carbohydrate and protein. It should be particularly emphasized to keep the protein intake as low as 1 gram per kilogram of body weight, because of the well-known fact that 58 per cent of protein is glucose-forming. The object of the diet is, of course, to produce a ketosis, i. e., acidosis, as shown by diacetic acid in the urine. The test for acetone need not be done, as it is positive with very mild ketosis and a grade sufficient to give the diacetic acid test must be reached for clinical success.

CHART I. FOR DETERMINATION OF TOTAL BASAL CALORIE DIET.
R. B. SANDIFORD, 1921.


4
2
5
3
1
NORMAL STANDARD CALORIES PER SQUARE METER PER HOUR
AGE MALE
AGE FEMALE
HEIGHT IN FEET
HEIGHT IN CENTIMETERS
TOTAL CALORIES PER DAY
SURFACE AREA IN SQUARE METERS
WEIGHT IN POUNDS
WEIGHT IN KILOGRAMS
DIRECTIONS:
PLACE THE CHART ON A FLAT SMOOTH TABLE. USE ONLY A RULER WITH A TRUE STRAIGHT EDGE. DO NOT DRAW LINES ON THE CHART BUT MERELY INDICATE THEIR POSITIONS BY THE STRAIGHT EDGE OF THE RULER. LOCATE THE VARIOUS POINTS BY MEANS OF NEEDLES (PIN STUCK THROUGH THE ERASER OF A LEAD PENCIL).
LOCATE THE PATIENT'S WEIGHT ON SCALE I AND HIS HEIGHT ON SCALE II. THE RULER JOINING THESE TWO POINTS INTERSECTS SCALE III AT THE PATIENT'S SURFACE AREA. LOCATE THE AGE AND SEX OF THE PATIENT ON SCALE IV. A RULER JOINING THIS POINT WITH THE PATIENT'S SURFACE AREA ON SCALE III CROSSES SCALE V AT THE REQUIRED TOTAL FOOD CALORIES FOR BASAL MAINTENANCE.

Each patient should receive an individual diet prescription with special account of the following three factors:

1. Total calories.
2. Nitrogen balance, i. e., protein.
3. Ketogenic-antiketogenic ratio, i. e., acid formers (fat) vs. antiacid (fat burning or glucose formers).

Vitamines, water, and salts are, of course, provided by the use of tomatoes, lettuce, salads, etc. These in turn give bulk, though 200 grams of fat a day is in itself sufficient to regulate the bowels in most cases.

1. Total calories: The basal metabolic requirement plus 30 to 50 per cent for growth and energy is the caloric allowance. It varies with the age, sex, height, weight, and surface area. From age 8 and upward it can be easily determined from the monographic chart of Wilder, Boothby and Sandiford for calculating basal calories. Three applications of a straight edge give the basal cloric requirement; 30 to 50 per cent of this figure is added. When an adult patient is above normal weight for height and age, basal calories should be calculated from the ideal weight. We may use insurance table weights as approximately accurate averages for the ideal weight. It is important that the patient should not receive food exceeding his energy needs.

For children under 8 years of age the basal calories may be taken from Talbot's [12] charts of the

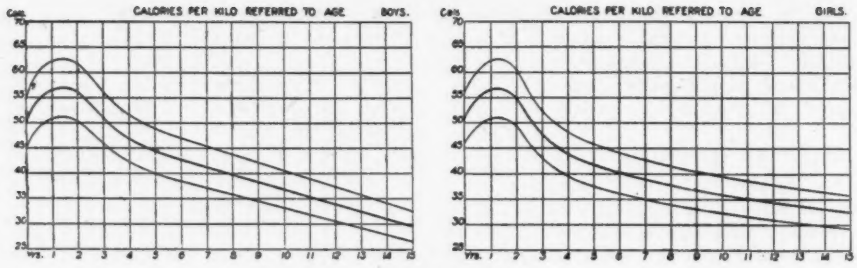


Chart No. 2

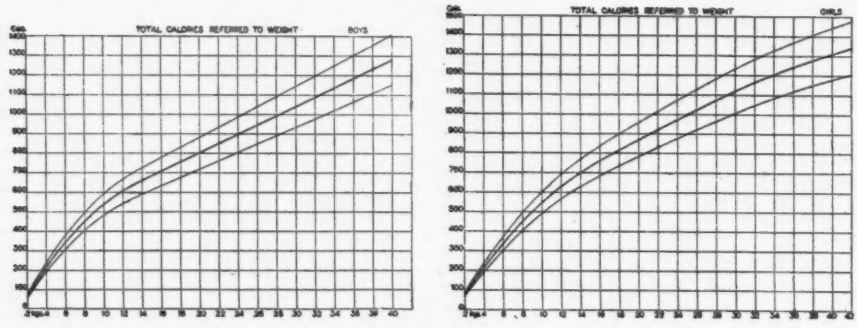


Chart No. 3

basal metabolism curves for infancy and childhood. Metabolism varies with age, sex, height, weight and physical conformity, so that a curve dependent upon any one or two of these factors can give only average figures. Variations within 10 per cent either side of the average curves, however, can be arbitrarily taken as the extreme limits of variation of children with approximately average development. Talbot shows that in children above average height and weight and with those small for age the total metabolism conforms with that expected from weight, but not for age. These variations are more pronounced in infancy than later childhood. Physical development plays an important part, but the proportions of body fat a still greater part in the deviation from normal.

We consult the curves for calories per kilo referred to age for the majority of children under 8 years of age, and the total calories referred to weight in subjects of abnormal development.

We must not forget, however, that it is ketosis which we must produce in our patient and that the curves for estimating basal metabolism are merely an indication of where to start, and that urine tests for acid bodies will be the guide as to the correct diet in the last analysis.

2. Protein: It has been sufficiently proven that growth and repair are adequately cared for in children by 1 gram of protein per kilogram body weight, and in adults by 2/3 gram protein per kilogram. So on this protein allowance the patient is in nitrogen balance.

3. Ketogenic antiketogenic ratio: While a 2:1 molecular ratio of fat to glucose formers is the threshold of ketosis for most persons, a more definite acidosis is usually required so that a ratio of at least 2.5:1 should be used.

So we get protein from weight, total calories from charts, fat from a formula, and carbohydrate from the difference between the sum of protein and fat calories and total calories.

The following formula gives the amount of fat necessary for a 2.5:1 ratio when the total calories (M) and the protein (P) are fixed:

$F = 0.101\ M - 0.216\ P.$

Example: A female child, age 8, weighs 60 pounds (27 kilos), and is 4 feet 6 inches tall.

1. Basal calories from nomographic chart = 1310.
2. Thirty per cent added for energy and growth = 1703—total calories.
3. One gram protein per kilo = 27 grams.
4. To get fat substitute in formula:

$F = 0.101\ M - 0.216$ P., i. e.,

$F = 0.101\ (1703) - 0.216\ (27)$, or

$F = 172 - 6 = 166$ grams fat.

5. Carbohydrate is calculated from the difference between calories of the above protein and fat and the total caloric allowance, i. e.:

27 grams protein x 4.1 = 111 cal.

166 grams fat x 9.3 = 1544 cal. Total = 1655.

Total daily caloric allowance of 1703 — 1655 = 48.

$48 \div 4.1 = 11.7$ grams COH.

Therefore our diet is COH, 12 grams; PROT. 27 grams; fat, 166 grams. Total calories, 1703.

This is a ketogenic-antiketogenic ratio of 2.5 to 1.

The formula for a 2:1 ratio is: $F = .099\ M - .223$ P, and that for a 3:1 ratio is: $F = .103\ M - .211$ P.

I have selected the following two cases to illustrate the ease with which some epileptics respond to

diet therapy and the difficulty with which others are kept convulsion-free.

CASE 1—A boy, aged 5½, was brought to the clinic complaining of "fainting and convulsions" of five months' duration.

Family History—Negative.

Past History—The child was born normally at full term. He had whooping cough at 2½ years, influenza about 4, both without complications. There was no history of injury.

Present Illness—Dates from March, 1925, five months before admission. For the first three months there were one to three "grand mal" convulsions a day. During the next two months their severity and frequency increased until the day before admission in August, 1925, there were sixteen generalized convulsions in twenty-four hours.

Physical Examination—Was essentially negative, including examination of the eye-grounds and x-ray of the skull. The routine laboratory findings were normal and the blood Wassermann negative.

Calculation of Diet—The basal caloric requirement, according to Talbot's normal standards of calories per kilogram referred to age, for a boy of 5½, weighing 53 pounds (25 kilograms) is 44 calories per kilogram or 1100 calories. Adding 50 per cent for growth and energy requirements, we have 1650 calories as the 24-hour allowance. One gram of protein per kilo body weight is allowed, i. e., 25 grams. The fat for a ketogenic-antiketogenic ratio of 2:1 is figured from the molecular formula of $F = .099\ (M) - .223\ (P)$, where (M) is the total calories and (P) the grams of protein. This gives a fat value of 160 grams. The difference between the sum of the fat and the protein calories and the total calories is the carbohydrate allowance, i. e.:

$$25 \times 4.1 = 102.5 \text{ protein calories}$$
$$9.3 \times 160 = 1488 \text{ fat calories}$$

$$\text{Total calories } 1650 - 1590.5 = 59.5 \text{ calories}$$

which being divided by 4.1 to give grams is 14.5 grams of carbohydrate. So the child was immediately placed upon this 2:1 molecular ratio of fat to glucose formers, a diet consisting of: carbohydrates, 15 grams; proteins, 25 grams; fats, 160 grams.

This borderline ketosis diet had a gram ratio of 4:1, four times the sum of the grams of C and P = the grams of fat.

Course—There was no nausea or vomiting on this diet. The convulsions gradually decreased. On the seventh day there were two. Since then, now eight months ago, there have been none. Urine tested daily showed acetone and diacetic acid constantly present after the seventh day. After the first two months a normal full, general diet was gradually resumed. Luminal, gr. 1, t. i. d., was given in conjunction with the diet, and is still being given. This boy is now energetic and bright, doing very well at school, and his growth and development have been normal. He is a striking example of successful diet therapy on a very low ketogenic-antiketogenic ratio. This case also illustrates the fact that the sooner the diet is begun after convulsions start the quicker and more easily results are obtained by diet therapy. As a rule the diet should be kept up for three to six months and then carbohydrate added 5 grams per week, and fat correspondingly reduced, until the patient is gradually returned to an almost normal diet.

CASE 2—A girl, aged 10, was brought to the clinic because of epilepsy of five years' duration.

Family History—There was migraine on the mother's side.

Past History—Birth and early development were normal. At 9 months of age a severe urticaria followed weaning. At this time there was one general convulsion lasting intermittently for two to three hours. Severe whooping cough for eight weeks at age of 3 and measles at age of 4 were the only past illnesses. At age of 9, four years after epilepsy started, malaria plasmodium was found in the blood. The child has "always been peculiar, liking few people."

Present Illness—At 2½ years of age, when first beginning to talk, the patient began to say, "I'm lonesome" and would then either laugh or cry in a silly manner, but there were no spasms. At 5 years of age the parents noticed "a funny look in the eyes," following which the child used to lie down feeling dazed for a time. A year later the grand mal (epilepsy) attacks began, and from then on, four years ago, there were at least one a week and as many as eight a day, with many petit mal attacks in addition. During the year 1924 the attacks averaged one a day and there were as many as six in one day, the longest free period being five days. On a ketogenic diet given at home in the last six months of 1925 attacks were reduced to an average of one every four days. This was a decided improvement, but the mental condition of the child was not normal. She was just at the threshold of ketogenesis, for the urine was at times negative and at times positive for acetone and seldom positive for diacetic acid. It is interesting to note that the majority of this child's grand mal attacks were initiated by the strange aura, the remark, "I'm lonesome," begun at the age of 2½, with her queer and unexplained crying and laughing spells.

Physical Examination—Essentially negative. A well-nourished and developed girl, irritable, intelligent, but of painfully slow reaction time. The routine laboratory tests, including Wassermann, were normal. Stool examinations were negative. The urine showed no diacetic acid or acetone.

Course—See text for the calculation of this child's diet. On January 19, 1926, this girl was placed in the hospital upon a ketogenic-antiketogenic diet, ratio of 2:1 with 30 per cent over her basal calories for three days. This was then increased to a ratio of 2.5:1, which was well tolerated. No drugs were given. After the first five days there were no convulsions, but the urine showed only traces of acid bodies. Fifty grams of fat were added to the diet, and still only traces of diacetic acid appeared in the urine. Another 40 grams were added, making a total caloric intake of 2395 and a gram ratio of 5:1. The patient tolerated this diet well. Diacetic acid and acetone became strongly positive in the urine, but the child soon showed evidence of gaining weight. The diet was now so reduced as to keep approximately this proportion of 5:1, reducing the calories to her basal requirement plus 30 per cent and maintaining the 2.5:1 ketogenic ratio. This reduced the carbohydrate from 12 to 7 grams. She left the hospital February 6, 1926, feeling very well and much brighter mentally, not having had a convulsion for fourteen days. During the month of February there were three petit and three grand mal attacks, in the face of this high fat ratio and the presence of marked diacetic acid in urine. During the first two weeks in March a severe attack of influenza with temperature of 103.5 and great prostration ensued. This infection was well weathered without complications and without change in diet, other than an occasional orange when acidosis was marked. There were no convulsions during this fever. The urine tests for acid bodies were still strongly positive. A half grain of luminal was given at bedtime from then on. During the latter part of March there were three convulsions although acid bodies still appeared in the urine. It did not seem probable therefore that the diet had been broken. The present diet is: carbohydrate 7, protein 26, fat 170, calories 1716. This is approximately a 3:1

molecular ratio of fat to glucose formers, with 1 gram protein per kilo, and total calories not in excess of energy requirements. Even at this there was one light convulsion on April 12. There have been no convulsions since.

This case illustrated the type of epileptic who needs a very marked ketosis over a prolonged period to circumvent convulsions. The urine tests for diacetic acid must be kept strongly positive and the caloric intake must not exceed the daily energy requirement. Luminal is a useful adjunct to diet. Although it is too early to be sure that this child is cured, her general health and mental condition are so improved that the treatment is considered by the parents well worth the trouble. High fat diets do not seem to be harmful during acute respiratory infection.

Comment — Wilder's original suggestion that aceto-acetic acid produced in the blood stream physiologically by ketogenic diets would have an anesthetic effect upon nerve cells seems well borne out in practice in this treatment of epileptics. The acidosis produced is certainly a factor in controlling an irritable nervous system and a ketonuria a satisfactory indication of the desired condition.

Attention should be called to the low protein intake on which nitrogen balance, growth and repair can be maintained. Clinically no child has required more than 1 gram of protein per kilo body weight, and the adults do well on two-thirds gram per kilo. This could be anticipated, as Hinsdale,[13] among others, has shown that nitrogen balance could be safely maintained by feeding .66 grams of protein per kilo of body weight. One of his patients on .66 grams protein per kilo had a daily excess of 2 grams of urinary nitrogen.

It is important that the total caloric intake should not exceed metabolic requirements, for even with a very high fat to glucose ratio a patient may fail to develop ketosis because the fat is being stored and not burned.

Metabolism controls the amount of aceto-acetic acid by a molecular balance between ketogenic materials such as the fats, and antiketogenic substances, i. e., COH and other glucose formers. Protein figures as antiketogenic to the extent of the glucose it can yield and this is considerable, about 58 per cent. Ten per cent of fat itself, through its glycerol content which may be a glucose former, is considered antiketogenic. So we have given us ketogenic-antiketogenic molecular ratio formulas from which we can write individual diet prescriptions containing proper amounts of fat, protein, and carbohydrate.

SUMMARY

1. Frequency: Conservative estimates by those in a position to know indicate that there are half a million epileptics in the United States, or that one person in every 250 of our population is thus afflicted.

Types: Certain cases of epilepsy are inherently milder than others. Some are organic and some show degenerative processes so marked that no treatment is of avail. The ketogenic diet treatment claims success in the mild types only.

2. Treatment: Diets containing large amounts of fat and minimal amounts of carbohydrate and protein now control many cases of epilepsy. Each patient should receive an individual diet treatment, the following three factors being especially taken into account:

(a) Total calories.

(b) Amount of protein (nitrogen balance).

(c) Ketogenic-antiketogenic ratio (fat to glucose formers).

3. Prescription: A simple method of writing individual ketogenic diet prescriptions for epileptics from Wilder's nomographic chart, Talbot's basal metabolism charts for children, and ketosis fat formulae is available. The diacetic acid urine test should be kept strongly positive.

4. Results: Results are variable, each case being an individual problem, but success in many cases and alleviation of symptoms in others may be readily obtained. Removal of foci of infection and the giving of pituitary extract and luminal are useful adjuncts to the diet.

The chief reasons for failure are: That ketosis is not kept at a sufficiently high degree, that calories in excess of energy requirements are allowed and that long-standing cases, either with organic disorders or with mental deterioration, are not ruled out as unfit subjects for this treatment.

In general, epileptics are not getting the attention they deserve. Diet therapy is the best treatment we have today.

Woodland Clinic.

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DISCUSSION

ALBERT H. ROWE, M. D. (242 Moss Avenue, Oakland)—The control of certain cases of epilepsy by high ketogenic diets is of great importance, and must be kept in mind as a possible method of therapy in all cases of idiopathic epilepsy.

There are a few cases of epilepsy, especially in children, which are apparently due to protein sensitization. The literature contains several reports of such cases, with favorable results from treatment based on such diagnosis. In my own work in allergy I have one case of severe epilepsy, associated with bronchial asthma, in a boy, which has been absolutely controlled for four years with pollen therapy, and I have several records of asthmatic children who had convulsions which seemed to be associated with food sensitization. It is possible that some of the relief that is obtained with the use of high ketogenic diets may be due to the exclusion or reduction of foods such as wheat and milk, to which the patient might possibly have been sensitive. This suggestion is made with the idea of bringing the etiological factor of allergy, as a cause for a limited number of cases of epilepsy, to the attention of the practicing physician, and also with the idea of offering an explanation for some of the relief which is obtained through the use of these ketogenic diets in certain cases of epilepsy.

J. WILSON SHIELS, M. D. (490 Post Street, San Francisco)—This contribution should not only be received with appreciation, but should awaken clinicians to a keen desire to further its value by subjecting selected epileptics to the diet therapy so worthily set down.

The last sentence of Doctor Pulford, namely, "In general, epileptics are not getting the attention they deserve" is woefully true. Therefore it is the duty of all physicians to keep the therapeutic cup turned upward and catch every drop of scientific progress toward the cure of this tragic disorder. If this contribution served only as a spur to endeavor to cure, it will be worth while, but it is a valuable paper and one that should receive the serious attention of all internists.

I differ from Pulford as to the absolute need of hospital observation and education in this special diet therapy. I should be inclined to demand it. Whenever a careful test-tube analysis of a ketogenic diet is to serve as an index for treatment, and whenever a calculation of quantity and quality of foodstuffs is the foundation of that index, hospitalization is imperative. It is all very well to set down a calculation of diet for the use of the general practitioner, unschooled in modern metabolic returns, and it is most commendable to endeavor to place in his hands great aids to cure, but since many such aids are in their formulative period and since the utility advancement of medical experimentation demands most meticulous care founded on special study, I cannot overestimate the necessity of institution supervision and education of both the patient and the physician, who will be called upon to "carry on" the treatment.

This diet therapy is rational in every regard. Acetoacetic nerve cell anesthesia is, all other things being equal, a recognized fact, and therefore a controlled state of acidemia in an epileptic should and does, in selected cases, ward off convulsive seizures and thereby protect the patient from physical danger and eventual brain destruction. The great alkaline reserve of the body lessens the fear of ill consequence of this laudable endeavor. As a matter of fact, any form of treatment, be it rational or empirical, that has been shown beneficial results should spur the profession to a greater interest in the cure or relief of this too prevalent disorder. And so I repeat my appreciation of Doctor Pulford's excellent compilation and his own results in the use of Wilder's contention and Peterman's results.

I quite agree with the doctor in canceling effort to cure advanced and organically deranged epileptics. It would be too disheartening. I would have wished him to have more strongly advised the diet therapy for adults, but always under the direction of a physician specially trained to note the indications and contradictions associated. The method of treatment demands this precaution just as much as the beginning treatment of a diabetic. It is only in this way that the full benefit of modern treatment can be secured. What the future holds in the way of general professional efficiency I cannot say, but it is only by care at the present time that we can assure ourselves of the value of new therapeutic methods and hand them down to those who follow.

I admire the ingenuous admission of the use of luminal. This in no way detracts from the doctor's plea for the use of diet therapy in epilepsy, for in truth it shows his frank exploitation of its value and adds confidence in his reported cases and Wilder's contention that a blood stream containing aceto-acetic acid is a blood stream capable of inhibiting the irritation of nerve cells. Again I approve of his advice to use diacetic acid as an index in the urine rather than acetone, its decomposition product.

Finally, Doctor Pulford's summary of the subject has been most thoughtfully worked out and is a worthy addition to this important therapeutic subject.

ARTHUR E. MARK, M. D. (1680 North Vine Street, Los Angeles)—Pulford has presented us with a most interesting and valuable paper.

Idiopathic epilepsy, which constitutes the greatest percentage of epilepsy, is, as brought out by the essayist, unattended by degenerative changes. The patient with this type of epilepsy is practically always in perfect physical condition.

The importance of heredity cannot be stressed too strongly, especially in epilepsy developing on a migraine basis. The latter is a fairly common occurrence. Both migraine and epilepsy are periodic seizures of an explosive type often precipitated by seemingly trivial influences. Patients subject to either of these two afflictions possess a nervous system which is hypersensitive. Epileptic seizures, as well as migrainous attacks could be explained on the basis of a temporary edema of the brain very similar to the changes occurring in the chest during an asthmatic attack.

It is logical to assume that pathologic changes of a transient character are present during attacks of epilepsy and migraine.

The etiological factor of allergy, as brought out by Rowe, could explain transient pathological changes, and should not be lost sight of, especially in certain cases of epilepsy occurring in children. With this possibility in mind a more extensive use of sensitization tests should be encouraged. At all events our treatment of necessity must be of such a nature that it will render the nerve cells less sensitive to both external and internal stimuli. Such seemingly trivial factors as eyestrain are very important in this connection. The use of luminol, bromides, etc., while of extreme value, should not be utilized to the exclusion of other measures.

It has been repeatedly emphasized that a high protein diet is inadvisable in epilepsy. High protein intake activates metabolism and, in general, acts as a nerve stimulant. Diets high in carbohydrates are productive of gastric irritation, which in turn favors the development of epileptic attacks. The logical diet, especially in view of the anesthetic effect produced by the resultant acidosis, is one high in fats and low in carbohydrates and protein. A more universal use of the high fat diet should be practiced, re-enforcing it with luminol and other measures, as brought out by the essayist.

It should be borne in mind that a form of epilepsy unattended by mental deterioration occurs from time to

time in children up to the ninth or tenth year of age. These cases are of special interest, as frequently many spells may occur daily. Spontaneous cure around the tenth year of age is common. Control of the attacks is often obtained by caffein citrate. This type of case should be especially responsive to high fat diet.

How long to keep an epileptic on a diet of this type is often a difficult question. Over a period of six to twelve months no evident injury occurs. I would like to ask Pulford if, in his opinion, persistent use of high fat diet alone might through its anesthetic effect on the nerve cells produce changes similar to those occurring following prolonged use of bromides. Personally, I believe that all patients with idiopathic epilepsy should be given the benefit of this treatment. I would also suggest that we use it in occasional patients with migraine.

W. D. Sansum, M. D. (Santa Barbara Cottage Hospital, Santa Barbara, California)—Doctor Pulford's paper represents very careful work and is both interesting and instructive. Many physicians will not appreciate how low the carbohydrate and protein must be reduced and how high the fat must be raised until they have tried to cause the constant appearance of diacetic acid in the urine. The slight acidosis which occurs in the beginning when more carbohydrate and less fat are used soon disappears. In this respect the epileptic patient is different from the diabetic patient who has a severe and constant acidosis on a much higher carbohydrate-fat ratio. I believe that insulin is more directly concerned in the burning of fat than is usually supposed. The epileptic patient who can make an abundant supply of insulin is therefore less sensitive to acidosis than the severe diabetic patient with his limited supply of insulin. It will be interesting to note whether epileptic patients treated with ketogenic diets lose in sugar tolerance as diabetic patients do when a continued acidosis occurs.

James W. Sherrill, M. D. (The Scripps Metabolic Clinic, La Jolla, San Diego)—In this valuable paper Pulford has mentioned the various dietary régimes used by early investigators in the treatment of epilepsy, also the fasting treatment employed by Geylein, which in 1921 gave early promise of good clinical results, but which later work failed to fully substantiate. He has called attention to the fact that it must be held clearly in mind that there are organic as well as functional epileptics, and that relief may not be expected if there is an associated degenerative process. The general poor results accomplished by diet measures, as reported in the literature, are most probably due to failure to take this fact into consideration. I have observed fourteen cases of adult epileptic patients of varying degrees of severity and deterioration subjected to complete experimental fasts ranging from fourteen to twenty-one days. Attacks were undoubtedly less frequent, probably due to coincident decrease of metabolic and catabolic processes, but such treatment is devoid of any real therapeutic benefit. The excretion of acid bodies in these cases was not as marked as in the case of the ketogenic diets reported by Pulford. I have also observed several epileptic patients subjected to high fat feeding over long periods of time without benefit. It is very extraordinary the large amounts of pure fat which the epileptic will injest in the course of twenty-four hours; frequently 300 to 500 grams. Pulford has called attention to the necessity of the restriction of the total calories in the diet to not more than 50 per cent above the maintenance requirement, likewise the importance of the preponderance of fat to carbohydrate in order to secure beneficial results. The application of ketogenic diets as outlined in this paper constitutes the most successful form of diet therapy for the epileptic yet recorded in the literature.

Doctor Pulford (closing)—Doctor Rowe's observation that allergy plays an important rôle in the etiology of certain cases of epilepsy is distinctly worthy of consideration. The suggestion of Doctor Mark that attacks of migraine and epilepsy have certain factors in common should prompt some of us to place a few cases of severe migraine on this ketogenic diet régime. As far as the reports in the literature go, high fat diets have never been observed even over a period of a year or more to cause any noticeable change in the nervous system either of animal or man, though of course the latter have never been subjected to objective examination.

The author is duly grateful for the added points brought out in the discussion.

THE USE OF GLUCOSE AND INSULIN IN THE PREVENTION OF SURGICAL SHOCK*

By C. Max Anderson, M. D.
Hermosa Beach

Discussion *by M. C. Terry, M. D., Los Angeles; Howard F. West, M. D., Los Angeles.*

An enormous amount of experimental work and study has been done on shock by eminent surgeons and laboratory workers in an attempt to find the causes of and apply the remedies for the prevention and cure of this dreaded complication of serious surgical procedures. The subject is so complicated, and the eminent workers in this field have held such divergent views, that the student is apt to feel more or less at sea in his study of it. Boyd [1] says: "The subject of shock is one which has exercised the medical profession for many years, more especially since the development of abdominal surgery, for it still presents what is perhaps the greatest menace to abdominal operations. . . . Even yet, however, although great advances have been made, and many theories previously held have been exploded, it cannot be pretended that the mystery has been finally solved."

Surgeons were quick to see the value of insulin in the preparation for operation of those patients handicapped by diabetes. But its importance in surgery uncomplicated with diabetes is only just beginning to be recognized by a few. To me this has become a field of investigation of most engaging interest relative to acidosis and shock or exhaustion, and one that may possibly overshadow all others in the importance of its results.

Thalhimer [2] first proposed the use of glucose and insulin in the treatment of nondiabetic acidosis. Moynihan [3] calls this reference "The supremely important suggestion."

At the outset it may be well to state that I do not conceive of surgical shock only in the terms of that extreme condition of exhaustion that precedes dissolution, but think of it as well in terms of the earlier and lesser degrees of exhaustion, marked by increased pulse rate, fall of blood pressure, and decrease in feeling and appearance of well-being following all major surgical procedures. It seems to me that all major surgical procedures produce a reaction on the patient, approaching to a greater or less degree that extreme state of exhaustion commonly known as surgical shock.

Having in mind the work of Thalhimer [2] and that following of Fisher and Snell [4] on the treatment of nondiabetic acidosis, the following tabulation of case histories of patients given glucose and insulin preoperatively is more than suggestive of the

* Read before the Los Angeles County Medical Association, October 7, 1926.

Case	Operation	Time on Table	Pulse Rate Begin.	Pulse Rate End.	Remarks (Vomiting, etc.) End Result
Mr. H. Age 40.	Resection pylorus. (Short loop Polya). Ether		64	70	No postoperative vomiting. Recovery. Excellent postoperative condition—patient was so starved before operation he could not stand alone. Considered nearly hopeless risk.
Mrs. B. Age 54.	Removal sarcoma of right thigh (large). Hysterectomy. Ether.	2′ 17″	112	100	Splendid postoperative condition. See chart of B. P. and pulse during operation. Recovery.
Mrs. H. Age 42.	Hysterectomy. Appendectomy. Ether.	1′ 20″	116	100	Remarkably good postoperative condition. This patient had marked anemia from uterine hemorrhage. H. B. 63 per cent. R. B. C. 3,420,000.
Mrs. B. Age 55.	Amputation of cervix, anterior colpoplasty, perineopoplasty, supervaginal hysterectomy. Ventral suspension of stump. Ether anesthetic.	2′ 25″	74	88	Uneventful recovery. Very little postoperative vomiting.
Mrs. M. Age 54.	Ventral suspension, anterior colpoplasty and perineal repair. Ether anesthetic.	2′	76	102	No postoperative vomiting. Uneventful recovery.
Mrs. P. Age 27.	Baldy Webster shortening of round ligaments. Appendectomy. Ether anesthetic.	1′ 10″	70	84	No postoperative vomiting. Uneventful recovery.
Mrs. M. Age 28.	Left inguinal hernia repaired. Local anesthetic.		78	68	No nausea or vomiting. Excellent postoperative condition.
Mrs. M. Age 63.	Anterior gastroenterectomy. Rectal ether anesthetic.		80	107	Little vomiting at first. Patient died a week later from mesenteric strombosis.
Mrs. F. Age 43.	Supravaginal hysterectomy. Ether anesthetic.	1′ 22″	80	80	Excellent postoperative condition. No vomiting.
Mr. C. Age 26.	Cholecystectomy. Adhesions removed. Polya resection of pylorus. Ether.	4′ 0″	102	120	Quite ill. Postoperative gastric hemorrhage; several blood transfusions. Postoperative intravenous glucose and insulin several times. Eventual good recovery.

possibility of shock prevention through the use of glucose and insulin.

On the following page is an operative chart of pulse and blood pressure of patient having a sarcoma removed from leg, followed by hysterectomy.

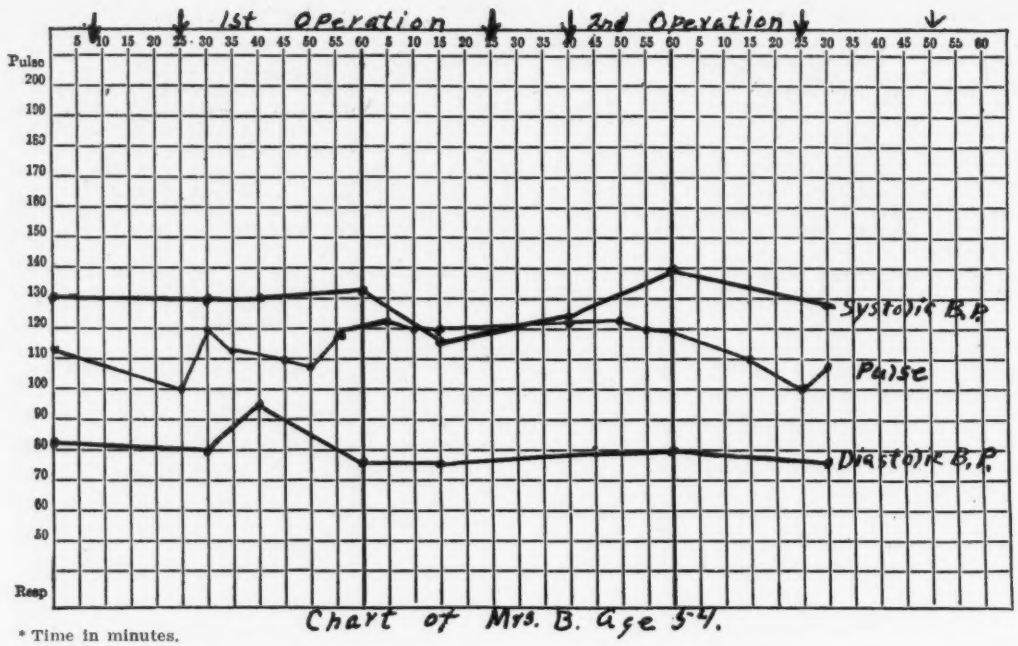
We have used glucose and insulin preoperatively on approximately thirty patients with excellent results. The above ten representative cases have been selected mostly on account of the difficulties encountered, prolonging the operation, and thus naturally tending to produce shock. The longest time was four hours on the operating table, with an average pulse rate at the beginning of the operation of 85.2 per minute, and at the close 91.9 per minute—an increase of only 6.7 beats per minute.

The difference in general postoperative condition of our patients is so marked that our assistants and nurses are enthusiastic about it. Our superintendent, who was seven years surgical supervisor in St. Luke's Hospital, Chicago, thinks she never before saw patients look and do so well postoperatively.

That acidosis is at least a constant accompaniment of shock, I think is generally admitted. The form of acidosis we are dealing with in surgical shock as well as that occurring in anesthesia is known as ketosis. It is the same as that found in diabetes and starvation.

Without going deeply into the physiochemistry of the blood and the fluids which bathe the tissues of the body, a few well-known facts with reference to acidosis may be recalled. The alkaline reaction of the blood and these fluids is exceedingly constant according to Macleod,[5] not varying more than PH 7 to PH 7.52, life being incompatible with great changes, actual acidity of course never occurring. This constancy is maintained by certain substances in the blood, termed buffer substances, which permit of considerable excess of either acid or alkali being added without change in its reaction, since they "soak up," so to speak, the added H or O H ions. This action is largely by phosphates and bicarbonates.

That form of acidosis known as ketosis is brought about by a faulty or incomplete metabolism of the



* Time in minutes.

fatty acids as in starvation or diabetes. It seems that the fats are more difficult of oxidation in the animal organism, and that the carbohydrates are required as the fuel for their complete combustion. The abnormal acids here produced by incomplete oxidation of the fats are B-Oxybutyric (CH_3 $CHOHCH_2$ $COOH$) aceto acetic (CH_3 $COCH_2$ $COOH$) and acetone (CH_3 $COCH_3$). These substances are known as ketones. These are the kinds of acids we have to deal with both in anesthesia and in shock.

Now let us consider a few of the theories that have been advanced to explain the phenomena of shock.

1. Paralysis of the vasomotor center causing a universal dilatation of the arterioles, thereby reducing the peripheral resistance with consequent circulatory failure. This has been proved untenable, as it has been shown that the vasomotor center is practically normal and the arterioles are contracted in shock.[5] [5a]

2. Paralysis of the splanchnic vessels resulting in bleeding the rest of the body into the splanchnic area. It was soon shown, however, during the recent war that in wound shock the splanchnic vessels were not enlarged.[5]

3. Capillary paralysis. Boyd[5] says: "The fundamental condition in all varieties of shock appears to be the empty state of the vessels. The heart has not sufficient blood upon which to contract, and the vital as well as the higher centers suffer acutely from lack of nourishment." . . . "At the same time there is an increased permeability of the capillary walls, so that a considerable quantity of fluid passes out into the tissues, although not sufficient to produce edema, with the result that the blood becomes concentrated."

4. Histamine and like substances resulting from trauma of the muscles and other tissues producing a toxemia that was responsible for the chain of symptoms present in shock. Turck[6] makes a strong argument for this theory, as does W. B. Cannon.[6a]

Macleod[7] says: "Taking the results as a whole and comparing them with clinical experience, a very strong case is made for the hypothesis that surgical shock is essentially due to intoxication by materials derived from damaged tissue."

5. The acapnia theory of Yandell Henderson is based upon the importance of CO_2 as a respiratory stimulant. He thinks the rapid respirations caused by painful stimuli, fear, etc., remove so much CO_2 from the body by excessive overventilation of the lungs that the normal stimulus to respiration is removed and that the later depression of respiration causes an oxygen starvation of the tissues and a resultant acidosis. Boyd[5] says "such a theory would be difficult to accept unless overwhelming proof could be brought forward in its favor."

6. Crile[8] believes shock to be an intracellular acidosis. He says: "From the fact that the cellular changes are apparently identical, whether produced by the injection of acids, by interference with oxidation, or by excessive oxidation; and, from evidence to be shown later, it would seem that a state of intracellular acidosis exists in exhaustion. We found that acidosis was produced by many causes, and a most striking and illuminating fact that inhalation anesthetics cause acute acidosis.

"This suggested studies of acidosis in its relation to shock and exhaustion which were undertaken in collaboration with Dr. M. L. Menten, and later a research on the reserve alkalinity which was investigated in our laboratory by the method of Van Slyke by Drs. W. H. Crozier, W. B. Rogers, and B. I. Harrison. When we found that acute acidosis

was present in all cases of shock and that the alkali reserves were reduced, we hoped that the work of Howell and of Seelig had indicated the long-sought specific, viz., the administration of sodium bicarbonate. But once again we were disappointed, as alkalinization resulted in only a temporary improvement; although as it seems to have some therapeutic value, we use in the clinic a 5 per cent solution of sodium bicarbonate with 5 per cent glucose as a routing rectal tap in cases in which exhaustion is present or threatened.

"It has long been evident that the word shock is a loose and unscientific term. We realize that it could well be dispensed with and the word exhaustion substituted. There is no clearly defined difference between exhaustion from this or from that cause. Whether an intracellular acidosis is established in the brain cells as the result of an excessive functional activity which forms acid by-products faster than they can be eliminated, as is the case in excessive exertion, excessive physical injury, excessive emotion, excessive electric stimulation, excessive adrenalin stimulation; whether the intracellular acidosis is caused by lack of oxygen as in asphyxia, in gas poisoning, in imperfect circulation, in excessive hemorrhage; whether the intracellular acidosis is caused by the intravenous injection of acids, or whether the acidosis is due to a disturbance of the physiologic equilibrium of the cell by adrenalectomy, or excision of the liver, the ultimate result is the same, and the fundamental factors which accomplish restoration are the same.

"We have come to look upon shock as an interference with the most fundamental mechanism of life. *An interference with the mechanism for the transformation of energy.* (Italics ours.) We have seen that extremely diverse factors are synergistic in the production of shock; that in general the cause of shock may be roughly divided into two groups, one comprising those in which an excessive energy transformation leads to intracellular acidosis, the other including those which cause intracellular acidosis and interference with internal respiration without an excessive transformation of energy. We have, therefore, designated our interpretation of shock the Kinetic *Theory of Shock.*"

Some exceedingly important experimental work bearing on this subject was reported by Best,[9] Smith, and Scott. They found that an etherized dog's blood contained 0.29 units of insulin per 100 cc. of blood as compared with 2.93 units per 100 cc. in a normal dog's blood and 1.66 units in a diabetic dog's blood.

Some other important work bearing on this subject is reviewed in the 1925 Year Book, General Surgery, page 27.

"A series of 150 cases was investigated by F. Schultze as to the relation of anesthesia to acidosis: acetonuria was found in 67 per cent after general anesthesia, in 85 per cent after local, and 40 per cent after spinal. Evidently it is not due to the anesthetic alone. Postoperative acidosis is due to age, sex, and a systemic predisposition. It seems to be a reaction to the shock of operation.

"Some toxic conditions following ether and their successful treatment are referred to by R. J. Minnitt. He described the symptoms after ether in the nondiabetic case as being less than, but comparable with, those occurring in the diabetic. A definite relationship existed between the hyperglycemia associated with ether anesthesia and the toxic symptoms. He suggested that treatment for these should be upon the lines found so successful in the diabetic, and drew the following conclusions from eight out of about thirty cases:

"That there is a definite rise in blood sugar varying with the length of anesthesia. Where the blood sugar falls at the conclusion of the anesthesia to approximately normal, and does not rise again, the patient suffers little, if at all, from vomiting, pallor, or acidosis. In the sugar-tolerance test performed before and after anesthesia the blood sugar curve is so altered as to show the efficiency of pancreas is impaired. Patients who exhibit toxic symptoms after anesthesia have a simultaneous secondary rise in blood sugar. Following the administration of insulin to patients with these symptoms, when the blood sugar is reduced they recover. The administration may have to be prolonged until the blood sugar is reduced, for it is not until then that improvement takes place. The administration of insulin at the end of ether anesthesia can mitigate the toxic symptoms or prevent them."

It seems, therefore, from our observations that surgical shock is a suboxidation due principally to insufficient elaboration of insulin in the tissues with a resultant acidosis probably intracellular as suggested by Crile.

This gives a more plausible explanation of the suboxidation than Yandell Henderson's Acapnia theory. One can readily see how toxins such as histamine-like substances might inhibit the body's output of insulin. Also how other untoward events such as fright, worry, pain stimuli, etherization, etc., might decrease its output. We know that emotional states very materially effect the output of other glands than the pancreas. Clinical experience and observation upon the carbohydrate tolerance of the diabetic indicates such is the case.

Furthermore this intracellular acidosis will explain the passage of considerable fluid into the tissues with a resultant blood concentration and the circulatory failure due to emptiness of the vessels as mentioned by Boyd [5] and others. We have only to recall in this connection M. H. Fischer's [10] theories relative to the production of edema. He believes that the cause of edema is the production of acids within the cell which lead to an imbibition of water by the colloids of the cell. This also in turn explains the lowered blood pressure that the earlier observers tried to explain on the theories of splanchnic paralysis and paralysis of the vasomotor center with arterial dilation.

With the foregoing discussions of acidosis and of the numerous theories of shock in mind, together with the knowledge that insulin is the natural oxidizing agent of the body for sugar, it is only logical to conclude that we have in the administration of glucose and insulin a specific, not alone in the treatment of acidosis and shock, but also for its prevention.

There are two other important and probably

fundamental factors to be considered in connection with this subject.

The first is that of heat. We, of course, know that the body processes are chemical reactions and that chemical reactions are accelerated by heat. It has long been recognized that it was important to conserve the heat of the shocked patient. Crile [11] has recently markedly lessened the tendency to shock by giving diathermy through the liver while operating. What more ideal method of conferring heat upon each individual cell of the body could be thought of than that of giving glucose and burning it up with insulin. This, of course, is probably more of a factor in the treatment of shock.

The second other factor to be considered is the dual action of insulin. Recent experimental work [12] has shown conclusively the very interesting fact that insulin possesses a dual action in the lowering of the blood sugar. The first and that which has been recognized from the time of its discovery is known as its hormone action and "aids in the fragmentation of the sugar molecule." The second is its action on the glycogenic function of the liver through the parasympathetic nervous system so that glucose is removed from the blood and stored in the liver as glycogen. This fact may have a very important bearing on the shock prevention we have noted. The filling to overflowing of the glycogen stores may very well be a very potent factor in the prevention of exhaustion. A large portion of surgical cases are ill, their appetite is poor and they are worried, their state of nutrition is poor, all of which favors depletion of the glycogen stores. In the olden days the custom was to starve and purge the patient preparatory to operation. The natural consequence was depletion of the glycogen stores and promotion of acidosis. Shock was certainly more common in those days than now. Surgeons have generally recognized that this method of treatment is a mistake, and today one rarely sees it carried out to any extent.

Our usual method of procedure is to give 60 grams of glucose in a glass of lemonade followed with 20 units of insulin by hypodermic the day before operation. At first we gave our glucose intravenously in 10 per cent solution, but found at times that we got rather severe reactions. Since changing to mouth administration as a routine method, our results seem to be quite as good and the patient is saved considerable discomfort at times and possibly some danger. Intravenous administration is reserved for certain selected cases in which oral administration is for some reason contraindicated.

CONCLUSION

This work was begun about two years ago as a result of Thalhimer's work and that of Fisher on nondiabetic acidosis. It was linked with Crile's theories of an intracellular acidosis in shock. Unknown to us Thalheimer began using this method in the treatment of shock and also in prevention in unfavorable risks about the same time or before this work was undertaken. I believe the simplified technique of mouth administration of the glucose together with the suggestion that *surgical shock is a suboxidation, due principally to insufficient elaboration of insulin in the tissues, with a resultant intracellular acidosis* is original with me.

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DISCUSSION

M. C. Terry, M. D. (921 Consolidated Building, Los Angeles)—I had the opportunity of observing Doctor Anderson's sarcoma case during the operation and afterward when the patient was recovering from the anesthetic, and I found the pulse in rate and quality to be as he has reported it, remarkably good for so prolonged and shock-producing an operation.

The experiments of Hepburn and Latchford [1] on the sugar consumption of the isolated rabbit heart transfused with Locke's solution containing 0.2 per cent dextrose showed that the addition of glucose to the transfusion fluid greatly increased the sugar consumption of the heart. This suggests that Anderson's results may be due, in part, to direct support of the heart muscle during a time of special need. Orsato [2] has based an insulin-dextrose treatment of typhoid and heart insufficiency on the results of similar experiments.

Howard F. West, M. D. (1032 West Eighteenth Street, Los Angeles)—While the theory of shock and the interpretation of the exact rôle of insulin in carbohydrate metabolism as expressed in Doctor Anderson's paper may be open to discussion, there is definite evidence for the practical use of insulin and glucose in preparing patients for operation. Very suggestive indications of a decreased pancreatic function during operative procedures have been described by a number of workers. This seems especially true when ether is the anesthetic. The characteristic findings are an increase in blood sugar, blood cholesterol and fatty acids with a tendency to ketosis. All of these abnormalities may be lessened or entirely con-

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trolled by insulin. The recent paper of Mahler [1] may be cited in this connection.

My own experience has been confined largely to surgery among diabetics. The absence of postoperative shock in those patients receiving insulin and glucose either just prior to or during anesthesia has been most gratifying. This has been true even in those patients where surgical emergencies have not allowed time for adequate diabetic control preceding operation. The difference between the diabetic and the nondiabetic under surgical conditions seems to be one of degree only.

While the absence of shock in Anderson's patients speaks well for his routine, it would seem that a still greater protection might be given to the patient if the insulin and glucose were given nearer to the time of operation. Most patients are taking food, especially the more concentrated carbohydrates, the day before operation, and in these the glycogen stores can be kept filled. If additional glucose and insulin could be given within two to six hours of the operation, one would expect maximum protection at the time most needed. If from 3 to 4 grams of glucose are given per unit of insulin there should be no difficulty from hypoglycemia in carefully watched patients.

Combined with warmth, fluids, and all the usual procedures for the avoidance of shock and ketosis, the use of insulin with glucose would seem to be a most valuable procedure in surgery and a form of treatment that merits more extended investigation.

Doctor Anderson (closing)—I believe Doctor West refers to some recent work being done in London under the direction of one of the discoverers of insulin that may seem to throw some doubt upon the original, and I might say universally accepted, theory relative to the oxidative function of insulin. In other words, a question has been raised as to whether insulin does actually assist in the burning of carbohydrate. Such work if confirmed will, of course, necessitate a complete revision of all former writings on the subject of insulin action. Undoubtedly such evidence will be very closely scrutinized and debated before accepted. I think my paper tends to strengthen the argument in favor of the generally accepted rôle of insulin in carbohydrate metabolism.

Doctor West's suggestion to give the glucose and insulin nearer to the time of operation would seem reasonable and may be worthy of trial. We have considered it and tried it in a very few emergency cases, but prefer our method for the following reasons:

1. We first developed the method through an attempt to combat preoperative acidosis in cases of what might be termed acute starvation and more or less accidentally discovered that we were preventing shock. This class of cases presents quite a percentage of the total number of surgical cases, and is I think without doubt better treated for a longer time preoperatively in order to be sure and have the existing acidosis cleared up before operation begins. The results have been so gratifying in these cases that we hesitate to make any change in any kind of a case.

2. We fear the insulin reaction coming on unrecognized while the patient is under ether. Banting states that one unit of insulin may utilize as much as 5 grams of sugar in certain individuals, while we know that in other individuals it may only utilize about 1 gram. We do not like to give enough glucose to surely buffer the insulin for fear the hyperglycemia may lower the resistance to infection. There is considerable evidence in the literature that such is the case.

3. The same group of workers who showed that insulin had a glycogenic function showed that this function was destroyed by the use of atropin, as this blocks the parasympathetic nervous system. We use morphin and atropin almost routinely preoperatively, and this would of course seriously interfere with insulin given a few hours before operation. Furthermore, Lincoln F. Sise and Albert A. Homer of Laney's Clinic, Boston, tried injection of 10 units of insulin postoperatively in a small series of cases and concluded that "the postoperative administration of 10 units of insulin subcutaneously has no favorable influence on recovery from operation and etherization" (*American Journal of Surgery*, October, 1925, p. 250).

I think their unfavorable report is undoubtedly due to drug interference with the insulin action.

4. I think giving the glucose so close to the operation would preclude its use by mouth, which I think is quite an advantage.

Some work that I have witnessed with glucose and insulin in cardiacs leads me to believe that Doctor Terry's suggestion with reference to the support of the heart is an important factor in these cases.

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UNDULANT FEVER*

By John C. Ruddock, M. D.
Los Angeles

Discussion *by Karl F. Meyer, Ph. D., San Francisco; Verne R. Mason, M. D., Los Angeles; C. W. Bonynge, M. D., Los Angeles.*

UNDULANT fever, usually known as Malta fever, has been known in epidemic form for a long time.

As the name Malta fever suggests, the disease is prevalent in Mediterranean countries with endemic foci in India, Africa, China, and Manila.

The greater part of our knowledge of this remarkable disease we owe to the work of the British army surgeons stationed at Gibraltar and Malta, particularly Marston, Bruce, and Hughes. In 1886 Bruce isolated an organism which he called *Micrococcus melitensis* from the spleen and blood of patients suffering from this disease. In 1904-05 a commission appointed by the British Government to study the disease on the island of Malta reported it to be a septicemia due to the *Micrococcus melitensis* and that 10 to 15 per cent of goats on the island had this organism in their milk, and that monkeys when fed this milk developed Malta fever. Following this report goats' milk for the troops on the island was stopped, and the cases of Malta fever dropped from 750 cases in 1905, to none in 1907 and has disappeared from the garrison since this date.

Holt and Reynolds called attention to the prevalence of the disease along the Mexican border. They concluded that Malta fever had existed in Texas for about forty years, in Arizona for at least fifteen years, and in New Mexico for a considerable time; the exact date of its appearance there not being determined. They also concluded that along the entire Mexican border of Texas, Arizona, and New Mexico, Malta fever should be suspected in any case of long-continued fever unless a diagnosis of some other condition could be definitely made.

Until five years ago all cases of undulant fever in this country were thought to be the same disease as that prevalent in the Mediterranean countries and due to infected goats' milk, but this was disproved when Keefer reported a case of undulant fever in the Johns Hopkins Hospital due to *Bacillus abortus*, and later corroborated by Evans, who isolated the same organism from several cases in an outbreak of undulant fever in the Southwestern

* Read before the General Medicine Section, California Medical Association, at the Fifty-Sixth Annual Session, April 25-28, 1927.

United States. It had been evident in these outbreaks that drinking goats' milk had not entered into the development of the epidemic.

A long series of experiments has now been completed by Evans, Meyer, and others, proving beyond the shadow of a doubt that *Brucella melitensis,* the cause of Malta fever, and *Brucella abortus,* which is the causal organism of endemic abortion of cattle and hogs, are closely related organisms. Evans and Meyer, classified this group of organisms, and have succeeded in growing many strains which have a varied pathogenicity to human beings. In order to correlate the knowledge of this disease, Meyer and Shaw proposed that the entire group be named *Brucella,* in honor of Doctor Bruce, who isolated *melitensis* in 1886. This name has been generally adopted, and these organisms are known in the literature as *Brucella melitensis* and *Brucella abortus.*

GEOGRAPHICAL CLASSIFICATION
(Evans)

Variety	Host	Where Isolated
Brucella var. unknown	hogs	United States
Brucella var. unknown	cattle	Germany
Brucella abortus	cattle, hogs, and humans	United States, Holland, Switzerland
Brucella var. unknown	cattle	United States
Brucella paraabortus	goats and humans	Sicily and Tunisia
Brucella melitensis A	cattle and humans	United States (Arizona and Texas) England
Brucella melitensis B	goats and humans	Malta and Tunisia
Brucella paramelitensis	goats and humans	Malta and Tunisia

Bacteriologically, any classification can only be made by means of the agglutinin absorption tests as the cultural characteristics are all identical.

It is now an established fact that *Brucella melitensis* var. *abortus* may infect man, and also that this same organism causes contagious abortion of cattle and other domestic animals.

The human infections contracted from cattle or hogs are indistinguishable clinically from those prevalent in Mediterranean countries and known as Malta fever.

Evans reported twenty cases of infection in the United States by the *abortus* variety of *Brucella melitensis;* sixteen of these were proved by blood culture, and all of them gave agglutination titers over 1:320.

No case can be considered proved unless the agglutinin absorption tests are carried out because of the cross agglutination among the various strains of the *Brucella* group and with the causative organism of tularemia.

It is to be noted that the majority of the reported cases of *Brucella abortus* infection which have been recognized in this country were found by a few observers, who, having had their attention directed to the disease by the recognition of one case, were able to find other cases by looking for them.

Human *abortus* infections have also been reported from other countries. Bevan reports thirty-five cases from South Africa due to *Brucella abortus* in 1925. Several series of outbreaks of abortus infections have occurred in Italy since 1925, numbering in all about fifty cases. Auchie gives a statistical table showing the alarming presence of abortus fever in France. From 1920-24, 952 cases; 585 of which were confirmed by laboratory methods, and up to May, 1924, 338 cases, and he thinks there may be a great many more.

SYMPTOMS

There is no specific fever which presents the same group of remarkable phenomena. The incubation period is from six to fourteen days followed by a gradual onset of symptoms. The patient usually continues at work although fever is present. The temperature gradually rises and the clinical symptoms are much the same as found in typhoid fever (lassitude, malaise, loss of appetite, and headache). After a few days the patient complains of pains in the limbs, back, and neck, which are rheumatic in character, accompanied by a slight sore throat which, upon examination, appears reddened and inflamed.

The fever, which is the outstanding manifestation and which gives the disease its name, is remarkable. It has a peculiar irregular curve consisting of intermittent waves or undulations of a distinctly remittent type lasting from three months, the average time, to two years. The undulations may be separated by apyrexial periods of varying lengths, so that relapses are common. The spleen and liver are enlarged and sometimes painful. This enlargement does not occur immediately, but after two or three weeks of illness.

Perspiration of a peculiarly disagreeable odor, profuse in character, associated with chilly feeling occurs from the beginning of the disease. Severe chills, however, are uncommon.

Neurasthenia and nervous symptoms are common. Delirium is rare.

Acute arthritis may be present with enlarged reddened joints which sometimes go on to suppuration. The arthritis is usually of the wandering type. Orchitis and oophoritis are frequently associated symptoms of the disease.

Glandular involvement is exceedingly rare.

Crops of peculiar small petechiae appear at irregular intervals around the extremities and body. These have a red periphery with a small white center resembling insect bites, and often itch.

Aside from a relative secondary anemia and leucopenia the laboratory findings are negative. The organism may be grown from the blood and urine, but does not grow until five to ten days after innoculation of the media.

Agglutination by the patient's serum of the specific organism will lead to a positive diagnosis.

DIFFERENTIAL DIAGNOSIS

The diseases with which undulant fever is most apt to be confused are malaria, particularly the aestivo-autumnal type, acute rheumatism, bacterial endocarditis, typhoid fever, tuberculosis, certain types of leukemia and tularemia.

CASE REPORT

Mrs. F., age 35 years, a young mother of three and one-half months with a nursing baby, who had been drinking,

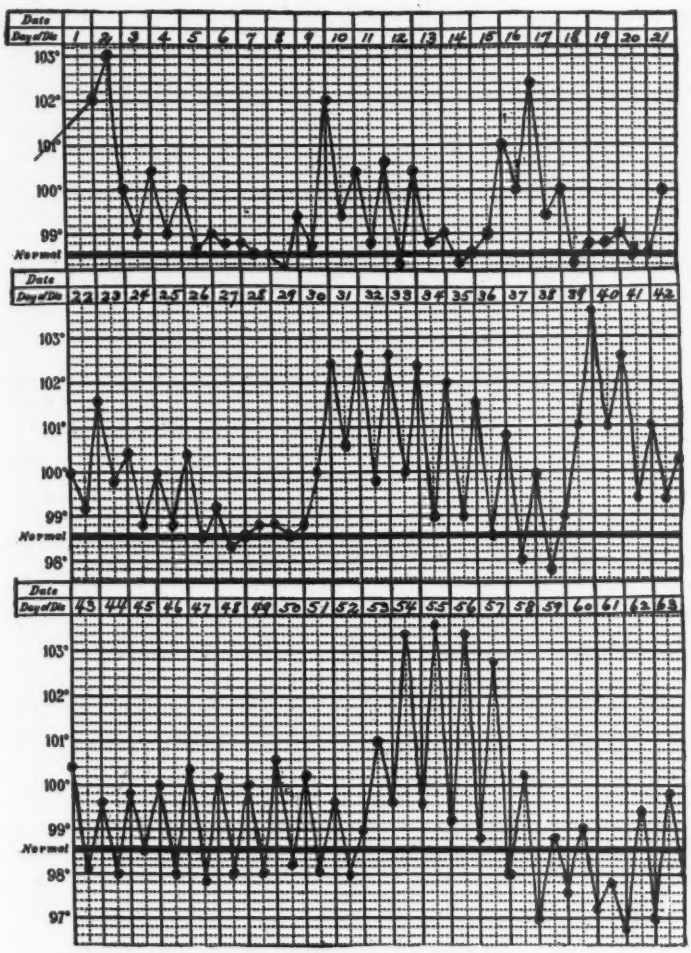

Plate 1—Undulant fever (first nine weeks). Case, Mrs. F. Note the undulations occurring throughout the chart with remittent type of fever

since the birth of her baby, about one and one-half quarts of raw milk per day from a small Grade A dairy.

She became sick on January 4, 1927, with a slight sore throat, chill, and menstrual flow (the first since the birth of the child) and a period of fever. The fever and menses lasted about four days. From this time until the middle of March the patient had periods of fever ranging from 100 to 104 degrees Fahrenheit lasting three to five days. During the attacks of fever the patient had a moderate menstrual flow.

During the fever chilly feelings were markedly evident associated with constipation and an irritable introspective mentality. There was a loss of appetite with corresponding loss of weight and strength, and drenching sweats of a peculiar odor. A diagnosis of miliary tuberculosis was made at this time.

Physical Examination—The patient did not look ill. Tongue: clean. Fundi: normal. Lungs: clear. Heart: normal in size, with a rough systolic murmur heard over the pulmonic area. Liver edge: two fingers below costal margin: Spleen: enlarged four times, not tender. Abdomen: soft and not distended. No glandular enlargement. No joint tenderness. Reflexes: normal. Crops of peculiar petechiae following fever periods which resembled insect bites. Pulse: average 80. Blood pressure: systolic, 110 mm.; diastolic, 65 mm. Pelvic examination: normal. Rectal examination: negative. No phlebitis. Urine: normal. Catheterized specimens: negative. Widal: negative. Wassermann: negative. Blood cultures: twelve blood agar plates; all negative. Blood count: red blood cells, 4,500,000; white blood cells, 3500; hemoglobin, 70 per cent. Differential count: normal. No malaria. Stool examination: negative. X-ray of gall bladder and chest showed no evidence of disease. Agglutination tests: negative for tularemia; *abortus* variety of *Brucella melitensis* positive 1:1280.

TREATMENT

To date there is no specific remedy for this fever, although many forms of treatment have been tried.

No drugs appear to have any special influence on the fever, although quinin, as given for malaria, should be tried.

Vaccines have been used many times without satisfactory results.

Serums from convalescent patients and autogenous serums made during the apyrexial periods have given practically no results.

General measures suitable for typhoid fever are indicated, such as liquid diet during the febrile period, hydrotherapy for temperature above 103 degrees Fahrenheit, symptomatic therapy, and careful nursing care.

Inasmuch as this disease is a general bacteremia or infection of the blood stream, the various blood antiseptics might be perhaps the treatment of choice, such as acriflavine, acriviolet, gentian violet, mercurochrome, etc. Acriflavine probably is the one of choice. This, however, is only conjecture, as there have been too few cases as yet treated by this method in order to arrive at any conclusion.

PROGNOSIS

The disease is usually self-limited with an average case duration of 120 days, although it may last for about two years. The mortality rate is approximately 2 per cent.

COMMENT

Although the case reported became apparently well after the administration of quinin, this may have been merely a coincidence, as the drug might have been given at the time the patient would naturally convalesce. However, this therapy merely served to further confuse the ultimate diagnosis, because it was then thought that we were dealing with an atypical instance of aestivo-autumnal malaria.

The presence of the irregular type of temperature with a rough systolic murmur over the pulmonic area, which was not present previous to the birth of the baby, two and one-half months before, ushered in with a sore throat, an enlarged spleen,

and crops of petechiae, confused the picture with malignant endocarditis.

The lassitude, loss of appetite, fever, drenching sweats confused the picture with miliary tuberculosis.

The recent delivery of a baby brought to mind pelvic inflammation and bladder and kidney infection.

Negative widal tests after two months of illness positively ruled out the entire typhoid group.

This differential diagnosis is given here to emphasize the importance of a *proved diagnosis* in any case of long-continued fever.

It is of interest to note that this patient nursed a baby for the first five weeks of her illness. The baby, however, did not contract the disease and suffered no untoward effects. This is a rather remarkable coincidence, as the disease is a milk-born infection.

CONCLUSION

All strains of *Brucella abortus* are not pathogenic to human beings, but only those strains that tend to have a melitensis variation.

It is of the utmost economic importance that the origin of the pathogenic strains of *Brucella abortus* be isolated and their habitat be definitely known, because it is known that a certain percentage of milk cows are infected and give abortus-infected milk.

Any case of long-continued fever with sweats, enlarged spleen and leukopenia, in which a proved diagnosis cannot be made should be suspected as an *abortus* infection.

The report of this case brings this type of infection to our attention, and should result in the finding of more cases.

1002 Pacific Mutual Building.

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DISCUSSION

KARL F. MEYER, Ph. D. (Hooper Foundation for Medical Research, Second and Parnassus Avenues, San Francisco)—During the latter part of the month of January, 1927, the Hooper Foundation was requested to examine a specimen of blood serum secured from a patient, Doctor B., living at Morenci, Arizona. The serological Study indicated an infection with *B. melitensis* var. *melitensis*. Two blood cultures, which were subsequently forwarded, confirmed the diagnosis of undulant fever due to the *melitensis* variety. Early in March another specimen of serum was forwarded by Doctor Ruddock of Los Angeles (the case reported in the preceding paper). It reacted with the same bacteria, but the absorption test suggested an infection with the *abortus* variety of the *Brucella* group. This case aroused interest in southern California. Several physicians sent blood cultures and serums. In the course of the last eight weeks the laboratory has tested seventeen serums and encountered five specimens which gave definite agglutinin absorption reactions with the *abortus* variety. The patients who furnished the specimens were clinically cases of undulant fever. One of the cases was confirmed by a positive blood culture. A final identification of this culture requires additional work. Comparative studies thus far completed indicate that it is not a true *melitensis* (probably a para-abortus). It is unfortunate that the other four cases were only recognized late in the course of the disease or at the beginning of the convalescence. Repeated blood and urine cultures have remained negative. However, of considerable interest is the fact that all the patients (with one exception) deny any contact with undulant fever patients, goats or goats' milk products. On the other hand it is claimed by all that they had consumed during the last six or eight months large amounts of raw cows' milk. An attempt was made to determine the sources of the milk supply, and just as many dairies as there are patients were found to have furnished the raw milk. A number of investigations are now in progress, since it appears of the greatest importance to establish, if in any way possible, the source of the *abortus* infections.

In this connection it should be recalled that comparative serological studies conducted since 1918 by a number

of workers lead to the conclusion that a clinical complex similar to Malta or undulant fever may be produced in man by the bovine *abortus* variety of the *Brucella* group. Although the existence of such cases, in the light of the findings made by Miss Evans, Keefer, Knowlton, Carpenter, Huddleson and others, cannot be denied, the following facts should be kept in mind:

1. Undulant fever cases due to the *Brucella* organisms which cannot be distinguished serologically from the organisms responsible for bovine abortion are medical curiosities, irrespective of the fact that *abortus* disease is widely distributed and exceedingly common.

2. The bovine *abortus* variety is not highly contagious for man. Laboratory infections have not as yet been reported.

3. Volunteers inoculated with the bovine *abortus* variety by Burnet and Conseil did not become infected.

4. The conditions under which infections with the *abortus* variety have occurred are unknown; they are unquestionably unusual.

5. Theobald Smith has shown that the human strains of the *abortus* variety behave in guinea-pigs like those of the porcine types of the *abortus* variety. Furthermore, biochemical studies recently reported by Rettger indicate that the porcine strains of *Br. melitensis* var. *abortus* resemble more closely the true *melitensis* strains than the bovine *abortus* varieties. However, it is generally recognized that it is impossible to separate by agglutination tests the porcine from the bovine types.

With this information now available the question arises, are the undulant fever cases which are serologically or culturally associated with the *Br. abortus* infections due to the *abortus* variety of bovine or of porcine origin? No final answer can be given. Attention must be called to the possible contamination of other foodstuffs than milk by porcine *abortus* strains. Furthermore, until it is definitely proven that the porcine strains remain confined to their original host, the swine, and that they cannot become accidentally lodged in the udders of cows, it will be impossible to speculate as to the danger of undulant fever infections from raw cows' milk. Then, again, in southern California there is always a remote possibility, since goat raising is practiced rather extensively and an exchange of animals occurs between Arizona and the state, that the caprine types of the *melitensis* variety may localize in the udders of cows. It is perfectly evident that the solution of the problem of the pathogenicity of the *Br. abortus* for man in California is much more difficult than, for example, in a northern state. It deserves careful and prolonged investigation before analogy deductions are drawn.

A tentative diagnosis of undulant fever due to the *abortus* variety of the *Brucella* group can be made with the aid of the serum agglutination tests. However, for further epidemiological studies the isolation of the suspected bacteria is imperative, and every possible effort should be made to secure blood or urine cultures early in the course of the infection. For the blood cultures the use of the Keidel tubes is highly recommended. The George Williams Hooper Foundation for Medical Research, Second and Parnassus avenues, San Francisco, will examine and study, free of charge, any blood serum cultures, etc., which may be sent. Since in two instances the use of vaccines has apparently shortened the course of the disease, the institution is prepared to furnish autogenous preparations for the treatment of the properly diagnosed cases.

VERNE R. MASON, M. D. (523 West Sixth Street, Los Angeles)—This case is interesting to the clinician as one of the more unusual types of long-continued fever. Although more than twenty instances of *Brucella abortus* infection in man have been reported in the United States and many others may have gone unrecognized, it seems improbable that the disease is of any considerable frequency. The clinical features are such that an internist might easily recall such puzzling cases in his past experience, and on this basis I believe the disease to be rare.

The fascinating immunological studies of Alice Evans on the *abortus-melitensis* group make us hope for equally interesting epidemiological studies. For this purpose it is necessary that organisms of this group be sent for study to those whose facilities are adequate. By this method rules for protection from the disease may be formulated.

C. W. BONYNGE, M. D. (617 Westlake Professional Building, Los Angeles)—Doctor Meyer has brought out the fact that our present knowledge of bacteriology is inadequate to definitely solve the problem of *Brucella* infection in man. With the usual seriological tests one would seem justified in forming the conclusion that *B. abortus*, as it exists in the cow, is infectious to man and that milk is a source of danger. This position has been taken by some few workers.

When the matter is considered carefully, however, there are many facts that do not agree with this laboratory conclusion, and make the above bold stand rather risky.

If raw milk is a source of some of our undulant fever, the dairy industry should adjust itself accordingly. Proof of this danger has not been brought forth as yet.

HAY FEVER IN NEVADA*

By HENRY ALBERT, M. D., AND VIRGINIA DEBELL, M. D.
Reno, Nevada

DISCUSSION *by Albert H. Rowe, M. D., Oakland.*

NEVADA has been generously supplied with hay-fever plants, and the victims are proportionately numerous. Indeed hay fever is one of the real health problems of the state.

Practically all of the plants responsible for producing hay fever belong to the wind-pollinated group as distinguished from the insect-pollinated plants. Plants depending upon insect life for fertilization have, as a rule, either brightly colored, conspicuous flowers or secrete a nectar in the heart of the flower to attract the insect, or both. Wind-pollinated plants, however, have no need of these inducements. The flowers, which often go unnoticed, are small and inconspicuous, with a structure such that the stamens project from the main portion of the flower. This gives the wind ample opportunity for scattering the small, dry pollen grains which are generally produced in great abundance.

It is now quite generally known that the insect-pollinated flowers are not important offenders in the production of hay-fever symptoms. However, the layman often has suggestions to offer in his belief that his hay fever is caused by alfalfa, roses, or goldenrod, which may sometimes be responsible when the flower is brought in contact with the nose. While it is sometimes difficult to collect sufficient pollen from the wind-pollinated plants, it is very much more difficult to collect pollen from those plants relying upon insects. The pollen is often very securely hidden, small in quantity, and sticky in nature. With this combination of factors it is almost impossible to make a satisfactory pollen extract from alfalfa and many other insect-pollinated plants.

In making pollen extracts for hay-fever tests, the plants are placed in water in the laboratory on waxed paper or clean plate glass. They are shaken daily and the pollen collected. Impurities are then removed by sifting the pollen through a fine screen, and the pollen extracted in glycerine and Cocoa's fluid. After tests for sterility the extract is appropriately diluted and is then ready for use, both for testing and for treatment.

The tests for susceptibility consist of making small skin scratches, and the application to such of a small

* From the State Hygienic Laboratory, University of Nevada, Reno, Nevada.

HAY-FEVER PLANTS OF NEVADA ARRANGED ACCORDING TO THE FREQUENCY OF POSITIVE REACTIONS

(Based on tabulations of thirty-one complete tests made at the State Hygienic Laboratory, U. of N., Reno, Nevada.)

Plant	Family[2]	1+	2+	3+	Total	Season
Russian Thistle	(C)	4	13	4	21	July-October
Annual Salt Bush	(C)	8	8	4	20	July-September
Shad Scale	(C)	6	9	5	20	March-June
Lamb's Quarter	(C)	14	5		19	July-October
Careless Weed	(A)	6	9	4	19	August-October
Red Root Pigweed	(A)	7	10	1	18	August-October
Wild Oats	(G)	10	2	4	16	April-June
Orchard Grass	(G)	8	7	1	16	June-July
Canary Grass	(G)	10	4	1	15	June-July
Red Top Grass	(G)	8	5	2	15	June-September
Rye Grass	(G)	4	7	4	15	July-August
Johnson Grass	(G)	12	1		13	April-October
Bermuda Grass	(G)	11	2		13	May-October
June Grass	(G)	10	3		13	June-July
Velvet Grass	(G)	7	2	4	13	June-July
Timothy	(G)	7	3	2	12	June-July
Mugwort	(W)	8	3		11	August-October
Coast Sage	(W)	6	4	1	11	August-October
Ash		8	2		10	April-May
Olive		9	1		10	April-May
Black Walnut		6	2		8	April-May
Ragweed (False)	(R)	5	2		7	August-October
Marsh Elder	(R)	7			7	August-September
Cocklebur	(R)	5	2		7	August-October
Ragweed (Western)	(R)	5	1		6	August-October
Mountain Sage	(W)	2	2	1	5	August-October
Cottonwood		3	2		5	February-April
Rabbit Bush		5			5	April-May
Yellow Dock	(D)	4			4	May-June
Ragweed (Giant)	(R)	4			4	August-October
Ragweed (Common)	(R)	1	1	1	3	August-October
Live Oak		3			3	April-May
Plantain	(P)	2			2	June-July
White Oak		1			1	April-May
Sheep Sorrel	(D)	1			1	May-June

[2] Family References:
A—Amaranths.
C—Chenopods.
D—Docks.
G—Grasses.
P—Plantains.
R—Ragweeds.
W—Wormwoods.

quantity of the pollen extract. Pollen may also be placed directly on the scratch mark and a small drop of a one-tenth normal sodium hydrate solution added. Absorption occurs rapidly. The reading is made in half an hour. Positive reactions indicating susceptibility are indicated by edematous swelling accompanied as a rule by redness and itching. The swelling disappears within a few hours.

Treatment consists of hypodermic injections of the pollen extract. It is better for prevention than cure. It is most effective when started about six weeks before the expected attack.

During the spring and summer of 1926, thirty-one hay-fever patients were each tested with about forty different pollen extracts.[1]

The table above lists the plants, the pollen extracts of which were used for the tests.

The plants are listed in the order of frequency of positive reactions obtained. The family to which the plant belongs; the number of positive reactions both total and the number of slight (1+), moderate (2+), and severe (3+) reactions obtained and season of pollination are also included in the table.

It will be noticed that the chenopods and the grasses are the most important groups in and around Reno. Russian thistle, a chenopod, leads the list as the most frequent cause of hay fever in this vicinity. Twenty-one of the thirty-one persons tested reacted to it. Other important plants are shad scale, red root pigweed, wild oats, and rye grass.

Russian thistle is found growing almost everywhere along the roads and in the fields, blooming from July to October, and producing a large quantity of light, dry pollen. Rye grass is a very good illustration of the grasses. It blooms from June to August and is very common along the roads and in vacant lots and, like Russian thistle, produces a large amount of pollen.

The four important members of the chenopods are Russian thistle, shad scale, annual salt bush, and lamb's quarter. With only one exception, in all the tests we have made, a person reacting to one of these reacts in some degree to them all. It is interesting to note that the four members of the chenopods head the list in producing hay fever, closely followed by the two amaranths—careless weed and red root pigweed.

The grasses are next in importance, taking each genus separately. When considering the grasses as a whole, however, they form the most important group because of the large number of plants repre-

1. The pollen extracts were chiefly supplied by The Cutter Laboratory, Berkeley, California.

sented. With the grasses we obtained 142 positive reactions as compared with eighty positive reactions with the chenopods and thirty-seven with the amaranths.

Each of our hay-fever grasses belongs to a separate genus, but when we get a positive reaction to one grass we also get positive reactions to most of the others. It is a question whether treatment with one grass will immunize against the remainder.

According to our data, the grasses are responsible for a little more than one-third and the chenopods almost one-fourth of our positive reactions. When, however, only the more marked positive reactions are considered, we find the chenopods and grasses to be of about equal importance in spite of the large number of the latter. Each group is probably responsible for about one-third of all our cases of hay fever.

A number of the plants which are very common in Nevada, such as sagebrush, rabbit brush, and cottonwood, fortunately are responsible for very little hay fever. Occasionally a reaction is obtained with one of these, but it is usually only slightly positive. These plants seem to be of very minor importance as causes of hay fever.

REACTIONS FREQUENTLY MULTIPLE

Many patients react to more than one pollen. The following table shows the number of decided (2 + or 3 +) reactions obtained in thirty persons tested:

Number of Persons	Number of Pollens to Which Reacted
Two	1
Two	2
Four	3
Three	4
Eight	5
Two	6
Two	7
Three	9
One	10
One	11
One	12
One	16

It will be noticed that only two persons reacted to only one pollen and that one reacted to as many as sixteen. One-half of all persons tested reacted to from three to five pollens.

Multiple reactions seem to be more common in Nevada than elsewhere. It brings up the question of multiple extracts for immunization. Such seems to be distinctly advisable in a great many patients. It would seem advisable, however, to try to limit the number of kinds of pollen extracts for treatment to three. One person who reacted to ten pollens obtained complete relief when treated with three. The person who reacted to sixteen pollens was treated with a mixture of three spring pollen extracts, and later with a mixture of three fall ones. He also had complete freedom from symptoms although he had had severe attacks of hay fever lasting for about two and one-half months each year for the past seventeen years.

The kinds of pollen extracts that should be used depend upon: (1) degree of reaction; (2) prevalence in the vicinity of plants to the pollen extracts of which patient reacts; (3) time of pollination as compared with time of hay fever; and (4) group to which the several reactors belong.

A member of one group tends to protect more or less against the other members of the same group. Thus in case a person reacts to more than three pollens it seems advisable to select one of each of the main plant groups represented by the positive reactions.

RESULTS OF TREATMENT

The results of the preventive treatment of hay fever by means of the appropriate pollen extracts have been very encouraging. A report was obtained from the physicians in charge of seventeen persons whom we had tested. Of that number five report complete relief from symptoms. All of the remainder were given considerable relief. In one it was only 25 per cent; in four, from 50 to 60 per cent; and in seven, from 75 to 90 per cent.

Some of the patients did not begin treatment until after symptoms of the disease had made their appearance. This may account for some of the less favorable results.

The really important problem is to try out a much larger number of Nevada plants as to their causal relationship to hay fever. This will require a large amount of work, but the results should readily justify the efforts and expense. When such has been done and a state-wide survey of the important plants has been made, we may expect to obtain very much more satisfactory results in the treatment of hay fever in Nevada than has been thus far possible.

DISCUSSION

ALBERT H. ROWE, M. D. (242 Moss Avenue, Oakland)—The choice of the pollens to be used in the treatment of a patient with hay fever is most important. This has received emphasis in Doctor Albert's paper. For the best results, he has stated that the physician must be acquainted with the botanical flora of the district in which the patient lives. The flora within a radius of several miles, especially in the directions from which prevalent winds blow, must be thoroughly studied, since light pollen can be carried by the wind for fifteen or twenty miles. The relative amounts of the various wind-pollinated grasses, shrubs, weeds, and trees, must be carefully determined, and the seasons and duration of pollination must be known. With such information at hand, one can decide from the history of onset and the duration of the hay fever, and from a record of the pollen reactions, which pollens should be used for desensitization.

We must assume that treatment with a given pollen will desensitize the patient to closely related pollens. However, it is difficult to be sure how specific such pollen desensitization is. I feel that for the best results desensitization must be quite specific and if necessary two or three antigens should be administered at the same time, each containing three or even four pollens. It is especially important to decide which grass pollens should be used for treatment of an individual who is clinically sensitive and who gives reactions to a large number of such pollens. The best plan is to take representatives of the various grass tribes, using specific pollens to which reactions have been obtained, and which are most prevalent in the patient's environment. I am satisfied that one grass pollen does not desensitize satisfactorily to all pollens in the grass family. The study of pollen plates for an entire season in a given district gives a numerical count of the pollens in the air and the limits of seasons of pollination which is most valuable to the allergist. When Albert has had the opportunity to study the flora of Nevada more exhaustively and has collected, through

local botanists, a complete group of the pollens of Nevada, his further reports will be of great interest.

The physician must watch the result of treatment carefully to obtain the best results. It is often advisable to continue treatment at weekly intervals during the season when the treatment has been preseasonal. When treatment is begun during the season, doses must be increased as rapidly as the local reaction allows. Thus in seasonal treatment the desensitizing dose can be reached within a comparatively few days, making co-seasonal treatment well worth while. The intradermal administration of pollen, as suggested by Phillips, promises to be of definite value in the rapid control of hay fever symptoms.

Whereas seasonal hay fever is nearly always due to pollen, such symptoms may be due to animal emanation proteins, orris root, various dusts, or even to seasonal foods. Where these are not the primary causes they may be complicating factors which should be recognized in the treatment of the hay fever problem. This emphasizes the fact that for proper control of patients with hay fever resistant to pollen therapy, especially if there is a history of mild symptoms throughout the year, other types of proteins than pollen should be used in testing the patient. This applies, of course, to the unusual case, but mention is made of these other causes to round out this consideration of hay fever.

NITROUS-OXIDE-OXYGEN ANESTHESIA OF CHILDREN*

REPORT OF TWO HUNDRED ANESTHETIZATIONS OF CHILDREN UNDER 10 YEARS OF AGE

By DOROTHY A. WOOD, M. D.
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IT was formerly held by anesthetists and surgeons in general that children could not be given nitrous-oxide-oxygen as an anesthetic agent. It was conceded that children from 7 to 10 might have a nitrous-oxide induction to an ether anesthesia, but that children under 7 must be given a straight ether narcosis with perhaps the use of oil of orange to mask the odor in the early conscious period. There seemed to be two main objections to the use of nitrous-oxide-oxygen. First that the task of breathing through valves in a closed mechanical apparatus was too great for the weak respiratory systems of young children. That the tidal volume of air for each respiration was too small to reach back to the supply with the closed apparatus and therefore nitrous-oxide-oxygen should not be given until the respiratory organs were developed enough to exhale a tidal volume of 300-400 cc. or, according to Gwathmey, until the child has reached the age of 10 or 12. The other reason seems to be that the plane of anesthesia in children is a very narrow one and that a smooth, even narcosis is difficult to maintain. A very slight change in the mixture takes the patient from too light to too deep narcosis. Very frequently children have little or no color, and where the anesthesia is so dependent on color changes there is no reliable gauge to the child's condition and anoxemia or asphyxia may too easily be mistaken for anesthesia.

Of recent years, however, the age limit for the use of gas has been gradually lowered until now, in most hospitals, it is being used to induce ether anesthesias from 3 to 4 years up, while many hospitals are using nitrous-oxide-oxygen anesthesia for young children. Doctor McCurdy uses nitrous-oxide for children of 6 months. Doctor McKesson uses gas from ten days, and feels that age has no influence at all in the selection of an anesthetic. Except for great care in securing the proper equation of gases, he does not think the technique differs from that in anesthetizing adults. In 1923 Doctor Botsford reported thirty cases under 4 years of age operated with nitrous-oxide-oxygen anesthesia. She feels that nitrous-oxide with sufficient oxygen to prevent cyanosis should be the anesthetic of choice for all operations where ether is contraindicated, and may be safely administered to infants, especially where further anesthetizations are necessary within short intervals of time.

The advantages of nitrous-oxide-oxygen over ether need not be enumerated. Suffice to say that nitrous-oxide-oxygen is to be preferred in respiratory tract infections to reduce the danger of postoperative pneumonia; in tuberculosis, to prevent dissemination of the disease; in high fevers and diabetes, to prevent acidosis; in nephritis and pyelitis, to prevent further kidney damage, and in mastoids with the usual attendant acute pharyngeal conditions to lessen the danger of postoperative lung complications.

It is with some temerity that I offer so limited a series of cases, realizing fully that there are many children's hospitals in the country which could show a much larger series, but a survey of the literature fails to find them reported. In a general hospital relatively few children are operated upon, and this report is limited to personal experience.

There were no fatalities in the series and only one near fatality, a baby of 2 years who developed a cervical adenitis following a mastoidectomy. The baby was successfully anesthetized with nitrous-oxide-oxygen for the mastoid, and no difficulty was anticipated with the second anesthetic when it became necessary to drain the abscess in the neck. However, the patient was very pale and apparently was given a too high percentage of nitrous-oxide. He stopped breathing, pupils were dilated, and all means of resuscitation, such as oxygen under pressure, artificial respiration and dilatation of the rectum, seemed to have failed, when the child of his own accord finally took a breath. Having once started, he continued and was able to leave the hospital in good condition. This experience taught us to err on the side of too light rather than too deep a concentration of nitrous oxide.

CLASSIFICATION OF CASES

One hundred and eleven of the patients were anesthetized for some genitourinary condition such as cystoscopies, pyelitis, or congenital malformation of the urinary tract where it was particularly desired that no ether be given. Ninety of these were for cystoscopic examinations that took from fifteen minutes to over an hour. A very light anesthesia usually is sufficient for these after the cystoscope has been inserted and the bladder has been distended with fluid. The remaining twenty-one were for longer truly operative procedures such as nephrectomies, ureteroenterostomies and plastic operations for epispadias, etc.

Fifty-one of the two hundred were for orthopedic

* Chairman's address, Section on Anesthesiology, read before the California Medical Association at the Fifty-Sixth Annual Session, April 25-28, 1927.

conditions. Many of these were on tuberculous subjects, and ether was therefore contraindicated.

Twenty-seven were general surgical cases; about half this number were appendectomies. The remainder were mainly hernias, drainage of abscesses and suturing of cuts, lacerations, etc. One was a thyroidectomy in a girl of 10 with anesthesia lasting two hours. One anesthetic was given to a child of 3, using an unreliable gas machine in an out-of-town hospital, for an appendectomy complicated by severe bronchitis.

Eleven were in the nose and throat department. These were all mastoids, and two of the patients were diabetics—one 10 years of age, the other 3. Nitrous-oxide-oxygen has not been used for tonsillectomies, as the dissection method for tonsillectomies is preferred, and fifteen to twenty minutes is rather long for satisfactory use of nitrous-oxide-oxygen when working in the back of the throat.

CLASSIFICATION AS TO AGES

There were eighty-five patients from 6 to 10 years of age, sixty-nine from 3 to 5 years, and forty-six of 2 years or under. The youngest was a baby of 11 months. The anesthestic was given for the radical removal of a sarcomatous kidney. That afternoon the baby was found standing up in her crib, laughing and shaking the crib gate as if nothing serious had happened to her that day.

REPEATED ANESTHETIZATIONS OF SAME CHILDREN

Quite a number of children had chronic trouble which needed repeated treatments. One boy with congenital bladder malformation had seventeen nitrous-oxide-oxygen anesthetizations over a period of two years, beginning when he was 2 years old, lasting until he was 4. One girl of 5 years had ten anesthetics within two months; three of them were for major operations and seven were for cystoscopies. One child of 3 years had nine anesthetics within six months. Another child of 2 years had eight anesthetics in three months. Two 5-year-old girls had five anesthetics each within two months. Four children had four anesthetics each, six had three each, and fourteen had two, while the remaining ones of the two hundred had one each. No untoward effects of repeated anesthetizations were ever noted. The children themselves became rather skeptical of the entire procedure and more reluctant to take the gas, but practically all could be reasoned with and understood that, after all, the gas was their best friend in the process of getting well.

TECHNIQUE OF ADMINISTERING ANESTHETICS

The gas machines employed were either the Ohio Monovalve or the McKesson. The procedure differs not the slightest from that used in administering to adults. In strong vigorous youngsters the induction is with pure nitrous-oxide lasting usually about forty-five seconds; then the mixture of nitrous-oxide-oxygen is given and continued to the end, when pure oxygen is given for about a minute.

In very pale, anemic, weak children the induction is made with a mixture of nitrous oxide and oxygen, the patient never being given pure nitrous oxide or allowed a too high percentage of nitrous oxide during anesthesia. Here also pure oxygen is given at the close.

Rebreathing and a closed system is used when relaxation is insufficient. Contrary to the old theory that children could not manage an anesthetic with a closed system, no difficulties at all have been found.

CONCLUSIONS

1. Nitrous oxide is the anesthetic of choice, especially in respiratory tract infections, tuberculosis, high fevers, diabetes, kidney pathology, and acute infections of the ear, nose and throat.
2. Children bear nitrous-oxide-oxygen anesthesia as well as adults, and there should be no age limit for its use.
3. Contrary to the old theory, children seem perfectly able to handle a closed system of anesthesia.
4. Technique of administration to children is the same as to adults.
5. Color changes in pale children are difficult to detect, and these children should receive a larger percentage of oxygen in the mixture.
6. No ill effects were noted from repeated anesthetizations of the same subject.
7. Two hundred administrations of nitrous-oxide-oxygen were given without ether, without complications and without a fatality.

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NON-INVERSION OF THE APPENDIX STUMP*

By FRANKLIN I. HARRIS, M. D.
San Francisco

DISCUSSION *by Charles G. Levison, M.D., San Francisco; Harold Brunn, M.D., San Francisco; H. A. L. Ryfkogel, M.D., San Francisco.*

IT is extremely disturbing to have our attention called to the startling fact that the mortality rate for appendicitis in the United States instead of declining as it should has been steadily increasing during recent years. Willis,[1] who analyzed the reports of the Bureau of Vital Statistics at Washington, concludes that in 1905 the death rate from appendicitis was 11.0 per 100,000, whereas in 1922, the last year for which figures are available, the rate was 14.4, or an increase of 30 per cent.

A disclosure of this nature should cause physicians to study the reasons for this increasing mortality and provide for their elimination. It is the purpose of this paper to review methods of treating the appendix stump as only one particular phase of the surgical technique which is believed to be responsible for a small but very definite percentage of the bad results.

The present methods of treating the appendix stump are mainly three (refer to Figure 1a):

(a) A preliminary ligation of the appendix at its base, its removal and the inversion of the ligated stump by a purse-string suture.

(b) The true inversion method in which, without any previous ligation at its base, the appendix

* Read before the San Francisco County Medical Society, September 21, 1926. From the Surgical Service of Mount Zion Hospital, San Francisco.

is removed, the stump is inverted into the lumen of the cecum and covered over by a purse-string suture.

(c) The non-inversion method consists simply of the ligation of the appendix at its base, its removal and dropping back the cauterized stump into the abdominal cavity. I shall now try to show that theoretically and practically the inversion methods are dangerous and unsurgical procedures.

In the present popular method of treating the appendix stump it is not truly invaginated into the lumen of the cemum, but is buried in the wall of

Fig. 1a

the cecum. True inversion is impossible, as the appendix has been ligated preliminary to its removal, and upon inversion a possibly infected stump has been buried in a closed cavity in the wall of the cecum. Even if the stump has been thoroughly cauterized and disinfected before its burial in the cecal wall, this method is, nevertheless, dangerous, for inevitably there is an exudate that forms about the necrotic stump. This exudate is bottled up in a cavity, the blood supply of which has been constricted by the inverting purse-string suture, so that the conditions are ideal for an abscess formation. This is not a purely theoretical objection, and occasionally a fatal outcome results from just this occurrence. The following case, which I found in reviewing the deaths from appendicitis in Mount Zion Hospital during the last four years, is cited to support this contention.

H. L., boy, aet 16, entered Mount Zion Hospital, January 5, 1922. Diagnosis, chronic appendicitis. He was operated on that date without any untoward incident. The appendix, after preliminary ligation of its base, was removed by actual cautery. The stump thoroughly cauterized and inverted with a purse-string suture of Pagenstecher by an operator of many years' experience and unquestionable skill. Patient returned to bed, and for two days following operation complained of considerable pain in the region of the incision. On the third postoperative day the patient's temperature started to rise, and from then on until his exodus on the tenth postoperative day he showed a typical clinical picture of spreading peritonitis. The autopsy confirmed this diagnosis of generalized purulent peritonitis, and there was seen in the wall of the cecum a huge abscess cavity in the region of the inverting Pagenstecher suture. There was no question but that the generalized peritonitis had arisen from the rupture of this abscess produced by the buried appendix stump.

It is surprising that this does not happen with greater frequency, but it does happen in a very definite percentage of patients, in many of whom the cause of death is not recognized as being due to this method of treating the appendix stump.

In the so-called true inversion, there is no such danger of cecal abscess, for the stump exudate drains directly into the lumen of the cecum. However, two other serious dangers must be considered here. We must remember that we do not pass a ligature around the base of the appendix previous to its removal, and the field of operation for that short period of time is in direct communication with the highly contaminated flora of the cecum. Theoretically, at least, it is not good surgery to expose the field deliberately to such a source of infection. But this is not the only nor the most serious objection to the complete inversion method. There is the still greater danger of secondary hemorrhage; for it has been shown that, in a fair percentage of cases, the meso appendix is absent, and the appendicular artery is in the wall and parallel to the long axis of the appendix and is caught only by ligating the appendix as a whole or dissecting out the vessel. Yet, the essential point of this method is not to ligate the appendix.

I have had no experience with this procedure, but Seelig [2] quotes two cases of hemorrhage from the bowel reported to him by Elsberg of New York and Charles Mayo following this method of treating the stump, in which the respective operators believed the hemorrhage came from the unligated appendicular artery. Hemostasis is as basic a law in surgery as is asepsis, so that this method must surely be considered unsurgical and dangerous.

The two methods so far described can be together criticized in that they both require the passage of a purse-string suture in the wall of the cecum. That this apparently simple surgical feat often results in a penetration of the bowel is not realized by the operator. We must remember that the wall of the cecum represents the thinnest portion of the entire intestinal tract. Roeder [3] has shown in a recent paper that, in one hundred appendectomies in which the inverting suture was used and immediately after the suture had been placed the needle and thread were dropped into a culture tube, in 88 per cent of those cases a positive growth was obtained, proving that the needle had penetrated the lumen of the cecum. Another possible result of the contamination of the purse-string suture is the occasional wound infection of the abdominal wall in interval and apparently clean appendectomies.

That we do not more often get into trouble as a result of this penetration is due to the remarkable protective powers of the omentum. The inevitable result, however, is a great incidence of postoperative adhesions, and Roder in this same paper has made a study of 105 appendectomies which later came to reoperation for various causes and in which he found that 85 per cent had adhesions around the cecum. He believes that the greatest cause of these adhesions is the trauma resulting from the passage of the purse-string suture.

There are many instances of acute appendicitis in which the base of the appendix is indurated, the wall of the cecum extremely friable, and the operator trained and taught to methods of inversion wastes considerable valuable time and further endangers his patient by repeated attempts to pass a satisfactory purse-string suture.

Anyone who has been around the operating room must have seen many cases in which, after an easy and rapid removal of the appendix, the operator spent considerable time trying to deliver an immobile cecum sufficiently for purpose of inversion. Such

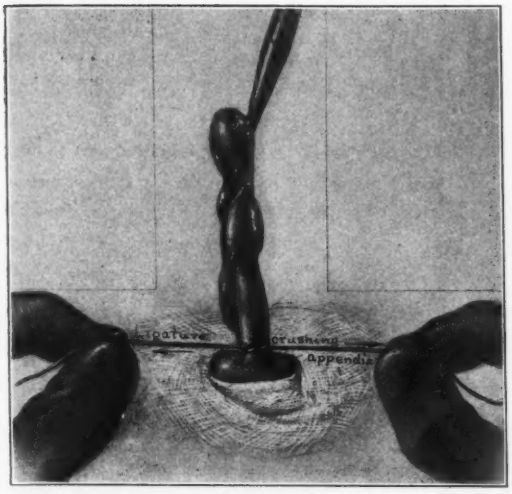

Fig. 1—After freeing the appendix from the meso appendix in the usual manner, it is held up by the assistant with a hemostat applied to its tip and, without any previous application of crushing forceps, a No. 2 chromic ligature is firmly tied about one-fourth inch from the base. This tie acts as a crushing forceps, and its ends are left long and held by the operator.

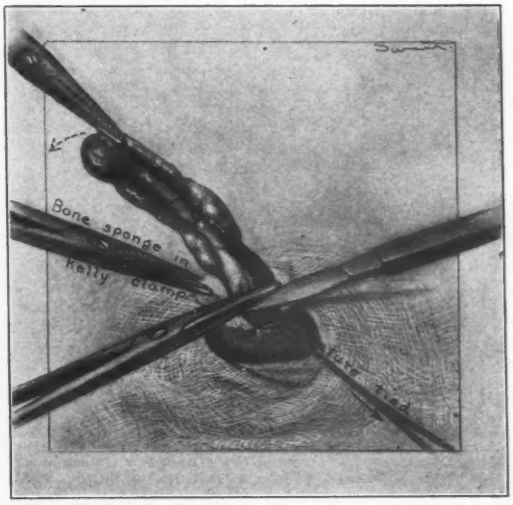

Fig. 2—A split gauze is carefully draped around the base of the appendix protecting the cecum, a straight Kelly clamp is applied about one-fourth inch distal to this tie, and a bone sponge is held in a forceps just behind the appendix by the assistant, and the appendix is severed by a knife, previously dipped in carbolic acid.

attempts are usually accompanied by much mauling and occasional tearing of tissues, with subsequent stormy postoperative meteorism.

Even assuming, however, that the cecum is not friable and is easily delivered into the operative field, there is still the danger of striking a small vessel in passing the purse-string suture and causing a spreading hematoma. We have all seen that happen, and often wonder if any harm results from this subserous hematoma. That harm does result occasionally is proved by the following case which I found in the review of deaths from appendicitis at the Mount Zion Hospital during the last four years.

Hospital, No. 36745. Woman, aet 23. Entered hospital, April 22, 1926, suffering from typical acute appendicitis. She was operated on the same day, a distended, infected appendix removed, the stump "inverted" in the usual manner. The operator noted in placing the purse-string suture that he had struck a small vessel which caused spreading hematoma in the wall of the cecum, but which seemed to be controlled before he closed the abdomen.

On the third day postoperatively, following an enema, patient complained of pain in the region of the incision. She looked badly, and blood count showed that hemoglobin had dropped from 75 per cent on day of entry to 57 per cent, and the red blood cells had dropped to 3,500,000. During the following three days the patient developed a septic temperature, looked worse each day, and on the seventh day postoperatively, a consultant advised reopening of the abdomen, as he felt there was an internal hemorrhage.

On April 29, 1925, at reoperation a large amount of free blood was found in the abdomen. The entire wall of the cecum was necrotic, there was a large amount of free blood and clots walled off by adhesions about the cecum, and a gangrenous mesentery. Patient expired despite transfusions and usual stimulation.

There seemed to be no question in the minds of the original operator and consultant of this particular case that the course of events could be traced directly to the small hematoma caused by the purse-string suture at the first operation.

There is still another reported remote danger due to the inversion method, with which I have not had personal experience. Thus Maloney [4] points out that there is a likelihood of the formation of inflammatory tumors of the cecum due to the buried silk or linen, and he has seen three such. Bunts [5] has shown the occasional formation of diverticuli following burial of the stump of the appendix. Case [6] has also shown by x-ray that there may be a stasis at the base of the appendix where a purse-string suture has been used.

Thus far I have tried to show that the inversion methods of treating the appendix stump are in theory and practice unsurgical. It now remains to prove that simple ligation with noninversion of the stump is a satisfactory and safe procedure. Those who are not familiar with this procedure can refer to the illustrations accompanying this article which show the exact technique of this method as I practice it.

One of the main theoretical objections to this method is the contention that the stump cannot be secure because mucous membrane is brought into apposition with mucous membrane. M. G. Seelig, in 1904, when this method was being popularized at Mount Sinai Hospital, New York, demonstrated by numerous microscopic sections taken through different appendices ligated in this manner that this objection is not valid. Microscopical section shows that the ligation forces back the mucous membrane for one-half inch, closing off the lumen completely; and further shows that the stump is fortified by four definite layers, from within out: (1) layer of polypoid lymphoid tissue; (2) thickened layer of resistant submucosa; (3) layer of muscularis; (4) layer of serosa, in addition to it being shut off by the infolding of the mucous membrane.

The next serious objection to this method is that it leaves free in the abdominal cavity a potentially infected stump. It has been proved by cultural tests that the application of pure phenol is sufficient to thoroughly disinfect the stump; so that the conten-

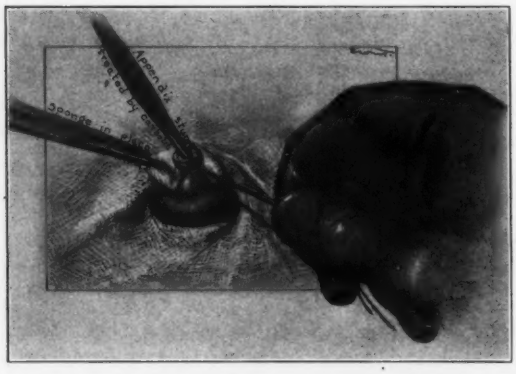

Fig. 3—The funnel-shaped stump which is now held by operator by means of the original tie is thoroughly cauterized by the application of the tip of a straight hemostat which has been dipped in a small basin of phenol in the same manner as a pen is dipped in ink, the bone sponge and gauze protecting the cecum from any excess of phenol. When the stump is whitened by the application of the phenol, which usually occurs after two applications, we can assume it is practically sterile.

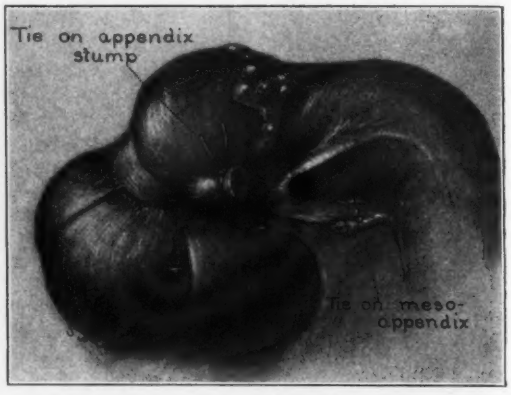

Fig. 4—The ends of the ligature are cut about three-fourths inch long, and the stump is dropped back into the abdominal cavity, completing this step of the operation.

tion that we are leaving an infected stump in the abdominal cavity does not hold good. It is true that there is certain to be some secretion poured out about this necrotic stump, but certainly there is no structure in the human body that is better able to take care of this secretion than the peritoneum.

Another argument against this method is that the uncovered stump will result in the formation of dangerous adhesions. Howard Lilienthal,[7] first in 1903 in a published report, and again recently (1925) in personal conversation, is very emphatic in his contention that this method is the *only* way in which dangerous adhesions can be prevented. He has examined many cases at postmortem from this point of view, and from his study concludes that the stump is cast off in three to six days, leaving a small, smooth, dimpled spot to mark the point of origin of the appendix. Furthermore he has noted that the operative region about the cecum was practically always free from adhesions.

Maloney of Cincinnati, who has had experience in 3500 cases treated by noninversion, states that in reoperative cases there never has been an adhesion seen, nor has the cecal scar been visible.

Horsley,[8] who also advocates non-inversion, makes the following statement: "I have had occasion to reoperate for other causes on a number of patients on whom the stump of the appendix has been treated in this simple manner, and in no instance have I found a serious adhesion or any other complication. In the majority of cases in which the stump has been buried I have found either unusual adhesions or a lump in the bowel or else a diverticulum, such as had been described by Bunts."

The crux of the whole argument is that if adhesions form around the site of an inversion, they form to stay and make trouble; whereas if they attach themselves to the stump which has been ligated tightly enough their traction on that stump will tend to cause its separation from the cecum, thus doing away with painful adherent adhesions and eliminating a possibility of an obstruction due to a band.

Finally, the criticism is made that the ligature on the stump of the appendix may blow off. Such a possibility should be given as much consideration as the surgeon gives to the possibility of a ligature blowing off of a large blood vessel. The stump of the appendix is soft, and the ligature usually sinks in, snug and securely; better in fact than it does on a good-sized artery. Moreover, the pressure within the cecum never begins to approximate the blood pressure; so that a surgeon who feels capable of safely ligating a blood vessel should be able to safely ligate the appendix stump.

However, the objections enumerated are all theoretical, for this method of treating the stump of the appendix has been used by the entire surgical staff of Mount Sinai Hospital in New York City, in thousands of cases during the last twenty-five years without a single cause for regret. My own personal experience at that hospital in observing over a thousand cases treated in this manner, as well as a small number that I have done privately and on the service of Harold Brunn at the Mount Zion Hospital of San Francisco, has failed to substantiate any of the criticisms directed against this procedure, nor have I noted any other reason for abandoning this method.

Since my first introduction to this method I have always believed that the incidence of fecal fistulae would be less if this method were more universally adopted. Just recently Colp[9] has analyzed about 3000 cases of acute appendicitis in which there was noted an incidence of 1.1 per cent fecal fistula compared to an incidence of about 5 per cent from other published statistics, and he believes that the lowered incidence in his series may be largely due to the non-inversion method of treating the appendix stump.

In conclusion, I have tried to show that the inversion methods of treating the appendix stump are dangerous, unsurgical, and unnecessary procedures for the following reasons:

1. There is danger of abscess formation in the wall of the cecum.

2. In the true inversion method there is danger of secondary hemorrhage from the unligated appendicular artery.

3. These methods are not applicable to every

case, require more time and offer greater technical difficulties.

4. They are largely responsible for the postoperative appendectomy adhesions and probably give a greater incidence of fecal fistulae.

5. They are the cause of remote complications such as inflammatory tumors of the cecum and diverticuli.

6. Judging from the review of deaths from operative appendicitis in Mount Zion Hospital during the last four years, and this review can be taken as typical of the average general hospital throughout the country, we can charge inversion methods of treating the appendix stump as being responsible for a definite percentage of our fatal results.

On the other hand, non-inversion offers us a method to which none of these objections can be made, and in addition it is undeniably simple, time saving, and adaptable to practically all cases.

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DISCUSSION

CHARLES G. LEVISON, M. D. (870 Market Street, San Francisco)—My attention was first called to this technique during an eastern trip about 1904. I was much impressed at the time, and had decided to adopt the method. At this time in conversation with the heads of two large clinics, I was informed by one of them that he had lost a patient because of a slipping of a ligature, and by the other that he had had a death from tetanus apparently due to the incomplete sterilization of the stump.

These experiences destroyed my interest in the procedure which I have never employed. I feel, however, that the method has great value because it has been practiced, to my knowledge, by many of the important operators in this country with satisfying results, for if the results had not been satisfactory the operation would have been discarded.

In my opinion it offers two definite advantages. First, the operation is easier because of its simplicity and rapidity. Second, and the most important, is the avoidance of subperitoneal hemorrhage consequent upon the puncture of a vessel. This is a potential danger always present in the purse-string technique.

HAROLD BRUNN, M. D. (384 Post Street, San Francisco)—Doctor Harris has given us very convincing arguments in favor of the noninversion method of treating the stump of the appendix.

We are all apt to follow procedures that we have become accustomed to use and that seem satisfactory without actually considering methods that may be an improvement and at the same time simplifying the technique.

The long series of cases in which this method has been used, and the test that has been given it in some of the best clinics in America immediately gives us confidence in the procedure.

Until Doctor Harris brought this simplified technique to my attention I had always used the inversion method with Pagenstecher or catgut stitch which most surgeons usually employ. For the past year I have adopted in all my cases, without exception, this method of simply tying off the appendix with chromic gut and carbolizing the stump thoroughly. The results have been most satisfactory, and I believe, taking it all in all, the convalescence is even smoother than with the inversion stitch.

The method has many advantages. It is extremely expeditious—I should say it consumes at least half the time of the other method. There is much less handling of the bowel and the danger of puncturing the lumen of the bowel or inverting a septic focus, or puncturing a vessel with hematoma, is entirely avoided. In pelvic work when the appendix is to be removed as a matter of routine, not because of disease, this saving of time makes it a satisfactory procedure. The removal of an appendix through a hernial sac, which often becomes necessary, is infinitely simpler with this technique.

My experience with the method is sufficient at the present time to warrant recommending it, and I am convinced that I shall never return to the older method of inversion.

H. A. L. RYFKOGEL, M. D. (516 Sutter Street, San Francisco)—About twenty-five years ago I saw Wyeth of New York remove an appendix by ligation without inversion, and heard him argue that it was the only rational method. From that time until five years ago I used this method in all cases where inversion was difficult because I realized that, so long as the method had been demonstrated by so able a surgeon, it could not be good surgery to add unnecessary trauma where the wall of the cecum was thickened and friable from inflammatory infiltration or where the stump was difficult of access. I continued to use the inversion method when it was easy.

About five years ago a patient on whom I had performed an appendectomy for recurring appendicitis in the interval developed a general peritonitis, and I believe the purse-string stitch was the cause.

Since then I have, without exception, used the simple ligation method described by Doctor Harris, and have no reason to repent my change. Lately I have been using the cautery knife to sever the mesentery and the appendix, and to sterilize the stump. This further simplifies the procedure.

Dr. Franklin Harris deserves much praise for his clear and thorough discussion of so important a subject and for so lucidly demonstrating that tradition still holds the majority of operators to an unsurgical technique.

Nation has Learned Lesson from State—The so-called "Monkey Trial" in Tennessee had at least one salutary effect on the people of the United States, according to Professor Samuel J. Holmes of the Zoology Department of the University of California, who is chairman of the Committee on Freedom of Teaching in Science of the American Association of University Professors.

Professor Holmes, through information sent to him by state universities, finds that although twelve states have had anti-evolution bills before their legislatures during the past year similar to those in force in Tennessee and Mississippi, not one was passed. In every case the legislators decided against any measure which would curtail the work of scientists.

The states involved were North and South Carolina, Oklahoma, Missouri, Arkansas, North Dakota, Minnesota, West Virginia, California, Delaware, Alabama, and Louisiana.

NASAL ACCESSORY SINUSITIS IN CHILDREN*

By ALBERT H. ALAND, M. D.
Ogden, Utah

DISCUSSION *by Francis L. Rogers, M.D., Long Beach; H. Rexford Hoobler, M.D., Oakland; J. A. Connell, M.D., Riverside.*

PROBABLY the chief reason why sinusitis in children has been so frequently and generally overlooked, is that the opinion has been and still is prevalent that the sinuses in children are so undeveloped that they are not to be considered as foci of infection. It is no doubt true that sinusitis is less frequent in children than in adults, but it is much more common than most rhinologists think. It has been a lack of knowledge of the anatomy that has largely accounted for this misconception. Onodi,[1] Schaeffer,[2] Davis,[3] Dean,[4] Armstrong,[5] and others have made studies which have corrected this misconception. This paper will therefore be devoted principally to a discussion of the anatomy, physiology and pathology of these structures.

No structures in the entire body are subject to such wide variations in size, shape, location, and development as the nasal accessory sinuses. Oppenheimer[6] says that investigations of anatomic specimens and references to the work of others, subsequent to 1912, when he called attention to the frequency of accessory sinus disease in children, seems to demonstrate that accessory sinus development occurs at a much earlier age than is generally considered by most investigators, and it is accepted that their variation in size, shape and position at different ages up to the period when they assume the adult type is extreme. Judging from the author's study of anatomic specimens and from radiographic evidence, there can be no doubt but that the variations in the adult are as great as in childhood. Although authorities differ somewhat in their opinions as to the time of appearance and full development of the sinuses, there is a fairly definite conformity in all the statistics available on the anatomy of these sinuses. It is conceded that the maxillary antra have the earliest development and can be recognized at about the fourth month of fetal life, and are well defined at birth. According to Schaeffer[2] the average size at birth is from 3 to 4 mm. wide, 4 to 6 mm. deep, and 7 to 8 mm. in the anteroposterior diameter. At birth the antrum is very rarely in intimate relation with the inferior meatus, as x-rays show the floor to be at the level of the attachment of the inferior turbinate and the rudiments of the deciduous and permanent teeth to be in the floor. The tooth buds are never found in the meatal wall. If the floor is above the attachment of the inferior turbinate, exploratory puncture should, of course, be made through the middle meatus. Usually after the age of 8 years the sinus is in intimate relation with the inferior meatus as a result of the changes in the bones of the face which occur during the second dentition. The antra are supposed to reach the adult type about the twelfth year, and are fully developed by the fifteenth to eighteenth year. Then the thickest wall is formed by the body of the superior maxilla posteriorly, and the orbital wall superiorly is the thinnest. The maxillary antra are very rarely absent. The early development of these sinuses accounts for their being most frequently infected in childhood.

Evidences of the ethmoid sinuses are seen at the eighth fetal month, and most investigators claim that the ethmoid labyrinths are always present at birth. At the age of 8 to 10 years, ostia are found opening into the nasal meati, those of the anterior ethmoid group draining into the middle and those of the posterior group into the superior meatus. The inflammatory conditions of the antra and ethmoids are more frequent than those of the frontal and sphenoidal sinuses which develop later. It is generally agreed that infection is much more frequent in the anterior group than in the posterior group of ethmoid cells. As the internal wall of the orbit forms the external limit of the ethmoid labyrinth, the possibility of ocular symptoms is apparent, and in operating in this region great care must be taken to avoid injury to the contents of the orbit by breaking through the very thin lamina papracea.

Concerning the frontal sinuses, it is claimed that they develop in one of three ways: (1) The result of an extension of one of the ethmoid cells into the frontal bone, (2) extension of the whole recessus frontalis, or (3) extension from the ventral extremity of the infundibulum ethmoidale. Oppenheimer[6] says they are usually not developed before the fifth to seventh year, and reach full development at the eighteenth year. Onodi,[1] Davis,[3] Schaeffer,[2] and others agree that the frontal sinus makes its appearance between the end of the first year and the beginning of the third year. Its development is slow, and by the sixth or seventh year it has reached the size of a pea. Full development is obtained at about the twentieth year.

The sphenoid sinus is a distinct cell in the body of the sphenoid bone at birth. Its real development begins at the fourth month, and usually a definite cavity exists by the third year. It is well developed by the seventh year, and reaches full development at about the fifteenth year. Schaeffer[2] has found this sinus as large as 5 x 3 x 2 mm. at birth, and thinks that it is fully developed by the age of 10 years. L. W. Dean[7] has reported a case of sphenoidal disease in a child 5 years and 5 months old in which at autopsy the sinus measured 18 mm. wide, 10 mm. deep, and 19 mm. in the anteroposterior diameter. Davis[3] and Onodi[1] think that the average size of this sinus at 2 years of age is 5 x 4 x 2½ mm., and Schaeffer and Mosher are of the opinion that this sinus is larger in children than we ordinarily expect it to be. Schaeffer[2] states that it may come into intimate relationship with the maxillary and ophthalmic nerves as early as the third year, and with the Vidian canal by the sixth year. In case of a very large ramifying sinus it is conceivable that these nerves may be involved much earlier. Sluder[8] states that at the age of 3 to 5 years the bone between these nerves and the sphenoid sinus may be only the thickness of an egg shell.

These numerous cavities and recesses adjoining the nasal meati form ideal locations for the implan-

* Read before the Utah Ophthalmological Society, April, 1926.

tation and growth of microorganisms. Adenoids and diseased tonsils are often the sources of the sinus infection which extends either by direct contiguity of tissue or through the lymphatics. Deviations of the septum, hypertrophic turbinates, polypi, congested nasal mucosa and small nasal cavities all interfere with the expulsion of nasal secretions and purulent matter and deflect expiratory and expulsive air currents in the direction of the sinuses into which infection is carried. These abnormalities also interfere with the ventilation and drainage, and thus prolong the period of infection once it is established. In childhood the upper respiratory tract is particularly susceptible to infection, and is known to be involved in nearly all the acute exanthemata, especially in measles, scarlet fever, pertussis, and diphtheria. In these diseases we are always looking for ear complications, but seldom investigate for sinus infections, which are probably just as frequent complications. It is likely that many cases of meningitis in children are the result of unrecognized sinusitis because the sinuses are surrounded by much softer bone than at a later period of life, there is a more profuse distribution of the lymphatic and vascular systems, the mucosa is in more intimate relation to the bone and open sutures and dehiscences in the bones of the skull make extension to the meninges much more likely than in an adult.

The bacteria most commonly found in sinus infection are the following in the order named: staphylococci (45 to 80 per cent), streptococcus pyogenes (40 to 76 per cent), pneumococcus (30 to 36 per cent). Influenza, pseudodiphtheria, Friedlander's bacillus, meningococcus intracellularis, bacillus coli, bacillus pyocyaneus, bacillus pyogenes-foetidus, bacillus tuberculosis, and micrococcus catarrhalis are the less frequently found organisms. It is considered that in the majority of cases the staphylococci are not the primary infecting organisms, but secondary invaders. Armstrong and Dean [2] in a series of twelve cases of arthritis in children between the ages of 3 and 13 years found the hemolytic streptococcus in the sinuses in eleven cases.

The symptomatology of nasal sinusitis varies considerably in individual cases. Sneezing, nasal obstruction, nasal discharge, irritability, pain or headache, poor appetite, and depression are common subjective symptoms, and mouth breathing, coughing, listlessness, underweight, and pallor are subjective signs. These symptoms and signs are especially significant if the tonsils and adenoids have already been removed, and the pediatrician has been unable to locate any systemic disease. Fever and pain are usually present in acute empyema and usually absent in chronic empyema unless it is during an acute exacerbation. The occurrence of chronic or frequent head colds with nasal discharge should cause us to investigate the nose and accessory sinuses for pathological conditions. Purulent or seropurulent unilateral nasal discharge, especially if intermittent, is suggestive of sinus disease, and usually one finds lymphoid hypertrophy in the nasopharynx corresponding to the side, where the nasal discharge is present and enlargement of the corresponding cervical lymph nodes. Severe occipital or vertical headache with more or less dizziness is suggestive of retained secretions in the sphenoid sinuses. Transillumination is sometimes of value in children, but is not very reliable because of the thickness of the antral floor containing the unerupted teeth. Examination with the electric nasopharyngoscope will localize the infection in some cases, as will also diagnostic puncture, aspiration and bacteriologic study. X-ray is the greatest aid in determining the presence or absence of sinuses and their size and shape, but for diagnosing the pathology within the sinus it is very unreliable in children.

Regarding the pathology in children very little had been written. Wood [9] has called attention to the fact that the bones in children are softer and more easily attacked than in adults. Armstrong [5] reports a case in a child 8 years old in which the antrum was practically empty, containing only a small amount of mucus, but in which microscopic examination of a small piece of tissue removed from the antral floor during operation showed a granulating osteitis. Zuckerkandl [10] states that when bone caries accompanies empyema the latter is the result of the bone caries, while Grünwald [11] believes that the empyema usually exists first and that the bone necrosis is secondary to it. The pathology [19] of chronic sinusitis shows a thickened mucous membrane, due to increased fibrous tissue elements, edema and more or less cellular infiltration, chiefly lymphocytes. Plasma cells, polymorphonuclear leukocytes and eosinophils are sometimes seen. Mucous glands when present are distended with mucus. The epithelial layer varies from normal ciliated columnar to stratified cuboidal type, and is often largely desquamated or replaced by granulation tissue.

It is the opinion of many of the most prominent rhinologists and internists that the relation of focal lesions in the accessory nasal cavities of children to systemic diseases, such as arthritis, endocarditis and nephritis, must be considered of an importance equal to that of the lesions appearing secondary to tonsillar and dental disease. Dean,[18] Armstrong,[12] White,[13] and others [14 15 16 17] have reported numerous cases of systemic infection, orbital abscesses, optic neuritis, and especially infectious arthritis, which have been cured by treatment of sinus infection. Their cases occurred in infants and children ranging in age from 6 months to 14 years. Killian reports operating on the frontal sinus in a child 15 months old. Dean [4] has diagnosed and treated suppurative ethmoiditis in children 1 year of age, and reported having drained the antrum in a child 11 months old. A French author has reported a case of empyema of the maxillary antrum occurring at birth. The youngest case the author has had was a baby 7 months old. This case was a most striking example of what the eradication of a focus of infection in the right ethmoid labyrinth did toward curing an osteomyelitis of the fourth metacarpal bone of the left hand which appeared with an orbital abscess of the right eye at the age of one month. When the patient was one month old the orbital abscess had been incised near the inner canthus and drained, and the abscess over the metacarpal bone was opened and drained at the same time. When the child was 3 months old an orthopedic surgeon curetted the metacarpal abscess and put on an exten-

sion splint because about one-half inch shortening had occurred in the bone. He advised having the ethmoid suppuration attended to, as it had persisted. On July 16, 1923, the author did an external operation on the right anterior ethmoid cells, which were found full of pus and granulations. By July 29 the wound had become dry and healed, and the sinus over the metacarpal bone, which had persisted for six months, was also healed. This patient was seen one year later, and there had been no return of the infection either in the ethmoids or in the metacarpal bone.

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DISCUSSION

FRANCIS L. ROGERS, M. D. (Long Beach)—The paper of Doctor Aland is a clear, able and timely summary of an important and somewhat neglected subject. That the occurrence of sinusitis in children is often overlooked, its frequency underestimated, and the importance of proper treatment often undervalued by the rank and file of the medical profession, must be admitted.

Even rhinologists have not all given to these little patients the careful, painstaking routine attention which they require, and which we give to adults with the same difficulties.

The fact that the orthodox treatment is not so easily applied to children is a reason, if not an adequate excuse, for many of our failures.

Faulty air drainage in the nose being the most common cause, the re-establishment of this function is naturally a matter of first consideration in treatment. The removal of infection in adjacent structures, tonsils, adenoids, or teeth, is of vital importance in the treatment of sinusitis in children.

Surgery in the nose of children up to 16 years of age should be most conservative.

The diagnosis once made by examination, including transillumination, and confirmed by radiograph, suction preferably by the use of Sonderman's hand bulb, or Nicholl's syphon, have been of great value in my hands in re-establishing adequate drainage, but they must be carefully and systematically applied over a considerable period, and should be tried in almost all cases of sinusitis in children before nasal surgery is undertaken. Puncture and irrigation of the maxillaries and sphenoids are justified in extreme cases.

The author of the paper does not refer to a rather frequent type of sinusitis due to obstruction or maldevelopment, which is often overlooked, and which leads to acute inflammation of the sinus—the so-called negative pressure type in which no discharge is demonstrated, and the sinus by transillumination and x-ray is shown to be clear. This, I believe, may occur in all the sinuses, but is especially prone to develop in the frontals or sphenoids, and is a prolific cause of chronic headaches in children and will explain many of the so-called sick headaches which we find among school children.

The establishment of normal air drainage by surgical procedure is the only means so far proposed which gives permanent and prompt relief.

The all too frequent use of aspirin and other headache tablets sold to the patient by druggists, and I fear too often prescribed by physicians, as headache remedies to these sufferers, is a serious admission, and has driven many a chronic sufferer in desperation to quackery of various sorts.

Doctor Aland's paper should be widely read by the general practitioner, as well as by rhinologists and ophthalmologists.

Better school inspection will locate these nasal abnormalities which predispose to sinusitis in children, and much can be done to prevent these conditions by more systematic and intelligent use of open-air schools.

When we have conquered the causes of "colds in the head" in children we shall have taken a long step toward the promotion of normal growth of nasal structure in the growing child, and shall in like proportion, prevent sinusitis in children.

H. REXFORD HOOBLER, M. D. (Oakland, California)—Doctor Aland has gone into the anatomy, histology and pathology of the accessory nasal sinuses in children and has given us much needed enlightenment on the fundamentals necessary for a better understanding of the infections of these parts.

He does not mention the lymph drainage and the adenopathy which results as a part of the symptomatology of these infections. Recent investigation shows a fairly constant enlargement of the posterior cervical chain of glands extending well out into the shoulder, especially in antrum infections. Little work has been done on the lymph drainage of the sinuses, and if the enlargement of these glands does not aid in diagnosis it may give us some better idea of the lymph drainage of this area.

The doctor is moderate in claiming so few systemic diseases due to these foci of infection. Many rhinologists claim everything from ingrown toenails to dandruff. Close relation has recently been shown between hemorrhagic nephritis and antrum disturbance. In inspection of school children I frequently see chorea associated with chronic nasal discharge. More often the child is anemic, underweight and nervous.

As a focus of infection in children, however, at the present I feel that teeth are far more frequently the offenders and tonsils a close second. With the spread of dental inspection in the schools the teeth as foci are fast being diminished. Parents are far more easily persuaded to have sinuses drained in children than to have tonsils out or teeth attended to.

Surgical interference no doubt is the predominant mode

of procedure at present among rhinologists. It is well, however, before proceeding surgically to irrigate the nose and attempt to build up the child's physical condition. If this fails the more drastic measures can be carried out. The use of the quartz light and sun baths is bactericidal, diminishes the adenopathy and improves the appetite. Bed rest is frequently necessary particularly in the case of the underweight child. Tonics improve the appetite and stimulate blood production. These may be compounds of iron and arsenic or food high in iron. Special care should be given to the mouth hygiene. Free drainage accompanied by the above measures usually brings about a rapid cessation of the discharge and a clearing of the infection.

The best prophylactic is to keep the child's nutrition up at all times. It is surprising how many physicians ignore anemia and underweight in children. If more attention was given to these we would have less sinus infection.

J. A. CONNELL, M. D. (Riverside, California)—Sinusitis in children is of great importance to the rhinologist and pediatrician, and more especially to the general practitioner.

I agree with Doctor Aland that in diagnosis and treatment of the accessory sinuses, as in any other part of the body, we must be familiar with the anatomy and pathology of the parts.

Probably one of the most sadly neglected, wrongly diagnosed case is that of a child with repeated and prolonged colds and a continuous discharge of pus or mucopus from the nose. These children are usually treated for the general condition, and are referred to the specialist only when other treatments have failed to restore the child's health. So the cases that come under our observation are usually chronic. Antrum affections are most common, then anterior ethmoid, sphenoid, frontal and posterior ethmoid.

The reason we do not find more of these cases is because we are not accurate enough in our diagnosis. In time gone by we used to call it a "cold in the head" or acute coryza, and that is as far as it went.

In regard to diagnosis, I deem it wise to make a bacteriological examination, transilluminate, x-ray and exploratory puncture.

Like all acute infections the vast majority heal spontaneously, but many times not until hypertrophy of the mucous membrane of the nose, as a result of the irritating acrid discharge from the mucous membrane causes a narrowing or obstruction to the nares, which in turn hinders the drainage of the sinus. And drainage is the main object, whether it be natural or artificial. The sinus openings in children are larger proportionately than in adults, and there is seldom complete blocking of all of the sinuses. As long as the normal osteum is sufficiently open drainage takes place, but there is always a risk that a permanent plug will form which will necessitate opening the antrum. Once reasonably sure that there is an infection, it is easy to puncture the antrum, and any discharge found can be washed out through the needle unless the infectious material is too thick to flow through.

When the infection is of nasal origin usually more than one group of sinuses are simultaneously affected. Besides the acute infectious diseases of children I think one of the most important contributing causes of nasal accessory sinus infections are enlarged tonsils and adenoids. Where the tonsils and adenoids have been removed we must first be sure no part has been left. Then if a nasal drainage persists I would suspect an anterior ethmoid or antrum infection, and possibly both.

I believe the very few nasal accessory sinus infections in children, due to diseased teeth, are the results of the trauma or death of pulp in the upper first molars which erupt at the age of 6 years. Due to lack of dental attention, the pulp may become involved before the age of 12 years, and cause the same type of antral infections that we find in adults.

The intestinal tract is now getting the blame in progressive medical circles for a good many things that used to be ascribed to the teeth or the tonsils, but we have decided, come what may, not to have ours removed, such as it is.—*Ohio State M. J.*

THE IMPORTANCE OF CHRONIC ARTHRITIS IN INDUSTRIAL WORK*

By CLARENCE E. REES, M. D.
San Diego

I SHOULD like to take a few minutes to call to your attention a condition which we all know and recognize, but which in our work we are apt to overlook or consider lightly in the face of the injury which we are called upon to treat. The very fact that a patient has had an accident or a sudden onset of symptoms often leads us to consider these the only factors in the case and to discount other findings as of secondary importance. These other findings, however, often prove to be the important elements and prolong the period of suffering and disability unnecessarily. The condition to which I refer is chronic arthritis.

With the exception of orthopedic surgery there is probably no branch of medicine in which arthritis plays so important a rôle as in industrial practice, and yet it is not seriously considered until it makes itself evident after the acute reaction of the injury has subsided. Chronic arthritis, I believe, adds to the period of disability more than any other condition met in this work. It has been my experience that a large percentage of the cases coming before our Industrial Accident Commission for claims and ratings are of this type. In such cases the insurance carrier denies liability, and the special examiner finds no cause for disability; the adjusters class such patients as malingerers.

The presence of chronic arthritis in the working man past 40 years of age is very common, especially among those who do bench work or work which requires long hours in one position. In fact the very frequency of this finding on the x-ray plates probably leads us to disregard its significance in the treatment of these cases.

We all know that arthritic joints are particularly susceptible to injury and that when injured they react to an abnormal degree, so that healing is correspondingly prolonged. These joints cannot be immobilized as long as can joints which were normal before injury, and neither can they be rehabilitated as quickly after the period of immobilization is over.

I am of the opinion that in those industrial cases in which chronic arthritis exists, the patient should be considered medically as well as surgically, and that we should seek at once the underlying condition which is responsible for the arthritis and direct our treatment to its correction as well as to that of the injury which has brought the patient to us. I fully appreciate the fact that some cases of arthritis are apparently resistant to all forms of treatment, but in many of these the condition can at least be held in check and the patient relieved of his symptoms if treatment is instituted. Such treatment, if started at the outset, will certainly make these patients more comfortable and, I believe, will enable them to return to work much sooner than would otherwise be possible.

Rees-Stealy Clinic.

* Chairman's address, Section on Industrial Medicine and Surgery, at the Fifty-Sixth Annual Session, California Medical Association, April 25-28, 1927.

CLINICAL NOTES, CASE REPORTS AND NEW INTRUMENTS

PEPTIC ULCER AND ACHLORHYDRIA*

CASE REPORT

By GARNETT CHENEY, M. D.
San Francisco

PEPTIC ulcer of the stomach or duodenum has always been considered rare in the presence of achlorhydria, while absence of free hydrochloric acid is expected in malignant gastric ulcers. Consequently achlorhydria as determined by the fractional test meal and therapeutic aspirations at the time of the distress may be of considerable diagnostic importance. Palmer [1] recently reviewed the literature on the subject and also 1004 cases of proved gastric and duodenal ulcer occurring at the Presbyterian Hospital in Chicago, and came to the conclusion that achlorhydria had been unequivocably demonstrated in but two cases. The case of gastric ulcer here presented did not show free acid by the usual methods employed during hospital residence, but it had been demonstrated six months previously. The absence of malignant changes was substantiated by autopsy.

CASE REPORT

Mr. H. S., 69, married, German American mining prospector and rancher, entered the hospital on March 17, 1927, complaining of indigestion. His family history and marital history are irrelevant, and his habits had been good. He had attended the out-patient clinic twelve years previously complaining of abdominal pain in the left upper quadrant which was completely relieved by regulating the bowels. A diagnosis of spastic constipation was made. He was quite well for the next ten years, and then began to suffer from indefinite attacks of indigestion with gaseous eructations and aching in the pit of the stomach which sometimes lasted hours, had no relation to meals, and was usually relieved by food or soda. He would have symptom-free intervals lasting several months. Six months before he entered the hospital these complaints brought him to the clinic again. A gastrointestinal x-ray showed a niche on the lesser curvature of the gastric antrum and a retention of 25 per cent of the meal at the end of twenty-four hours; and a single extraction Ewald test meal showed 26 degrees free hydrochloric acid and a total acidity of 39 degrees. A second x-ray a month later failed to show the ulcer niche, but marked retention was still present. He did fairly well on Sippy diet for several months, and then began to lose in strength and weight, vomited occasionally and had almost continuous pain the week before entry. He appeared quite emaciated at entry, there was moderate tenderness in the upper abdomen, and the blood pressure was low. The blood showed a slight secondary anemia, the blood Wassermann was negative, the stools were well formed and free of blood, the urine showed no albumen or sugar, and the icterus index and van den Bergh reaction were within normal limits. A third gastrointestinal x-ray revealed both the ulcer crater and the retention. After repeated gastric lavage over one week's time, two evening samples of juice failed to show any free acid, and a continuous quantitative estimation of gastric secretion by the method of Bloomfield and Keefer [2] gave very low ten-minute secretions, rapid emptying time and no acid reaction to Topfer's reagent or to neutral red in any of the specimens following the meal, the total acidity reaching only 6 degrees. The preoperative diagnosis was gastric ulcer, and the absence of free hydrochloric acid indicated that it was probably malignant. An almost completely healed ulcer measuring 3 x 4 cms. was removed by Finney's method of pylorrectomy and a gastroduodenostomy performed. Grossly there was no evidence of malignancy, and several sections of the specimen removed were reported negative for malignancy by Doctor Ophüls. The patient died of a subphrenic abscess and peritonitis two weeks after operation. A complete necropsy did not alter the postoperative clinical diagnosis of chronic prepyloric peptic ulcer with achlorhydria. The anacidity was not checked by histamine injection.

Stanford Hospital.

* From the Department of Medicine, Stanford Medical School.

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PYOCYANIC STOMATITIS WITH AGRANULOCYTIC LEUKOPENIA*

CASE REPORT

By FRED H. LINTHICUM, M. D.
Los Angeles

IN 1899 Gheorghiewski [1] claimed to have found a lencocyte-destroying ferment in cultures of the *Bacillus pyocyaneus.*

In 1924 Lovett [2] reported a fatal case of ulcerative stomatitis associated with extreme leukopenia in which the *Bacillus pyocyaneus* was associated as the apparent cause. This was the first case described as occurring in this country. During the year prior to this, however, about a dozen similar cases had been reported in Germany. The syndrome is variously known as "Agranulocytic Angina," "Agranulocytosis," or as suggested in the present title, "Pyocyanic Stomatitis with Agranulocytis Leukopenia." This name is suggested because, as will be explained later in detail, we have had occasion recently to see a case of ulcerative stomatitis accompanied by an extreme leukopenia, in which the *Bacillus pyocyaneus* was not identified, and in which the patient recovered.

Both the case to be reported today and a second one to be mentioned terminated fatally.

All the cases of the disease reported from Germany in 1923 terminated fatally, and in all of them, as well as the one reported by Lovett in this country in 1924, the *Bacillus pyocyaneus* was obtained from the typical lesions. There have been probably half a dozen cases of so-called agranulocytic angina reported in American literature since then, but in none of them has the organism in question been identified until in the present instance:

The patient in question was a woman aged 42 years. Had been married twelve years. Had been delivered of her first child by caesarean section five weeks prior to the onset of her present illness. Pregnancy had been complicated by a preeclamptic toxemia. She had been in bed since the delivery of her child, and when I first saw her she was complaining of a sore throat which had developed the previous night. Her temperature was 100 degrees; her pulse 90. There was a small grayish patch on the right tonsil with no involvement of the adjacent lymph glands. The next day the temperature

* Read before the Eye, Ear, Nose, and Throat Section, California Medical Association, at the Fifty-Sixth Annual Session, April 25-28, 1927.

was 101.4. The right tonsil was clear, but the left one had become involved in a manner similar to the opposite side. The tonsillar condition then apparently cleared up. During the next few days an exudate formed along the gingival margins. It spread to the inner aspect of the cheek, the floor of the mouth, and the ventral surface of the tongue. It did not extend to the tonsils or any other structure outside the buccal cavity.

The exudate was thick, gray, and formed fibrous-like bands extending from the gums to the inner surfaces of the cheeks.

It stripped off in large pieces, exposing a surface which did not bleed. On the fifth day the temperature was 104 degrees. The upper lip became edematous and tremendously swollen, followed shortly by a similar condition of the lower lip. By the seventh day the temperature was lower, the swelling of the lips was subsiding, and the exudate in the mouth was disappearing. On the tenth day she suddenly became worse; pulse poor, dyspnoeic and very apprehensive. She began to have involuntary stools. She became comatose, and died on the eleventh day of her illness.

Autopsy was of little or no help in furnishing additional information as to exactly what type of infection had caused her death. There was a moderate icterus. The heart was one-third larger than normal, and on histologic examination showed acute degenerative changes. The liver and kidneys showed evidence of old and acute infection. There was a healed duodenal ulcer and evidences of previous tuberculosis. There were other findings which had no bearing on the terminal illness except to indicate that we had been dealing with an individual whose powers of resistance were generally below par. Immediate cause for death was given as an ulcerative stomatitis and acute myocarditis.

The character and distribution of the exudate; the absence of glandular involvement; the course of the disease, suggested neither diphtheria nor an infection with Vincent's organism. Nevertheless, since spirillae and fusiform bacilli had been found in moderate numbers, it was deemed advisable to treat the case as one of Vincent's angina. Salvarsan was administered intravenously and applied topically, and the gums and mouth received suitable hygiene.

A day or so after the patient's death a re-examination of a portion of the membrane obtained from the mouth during the early stages of the disease revealed the presence of numerous bipolar-staining organisms which were thought to be those of diphtheria. These were soon found, however, to be actively motile and gram-negative, and were finally identified as *Bacillus pyocyaneus*.

This resemblance to the diphtheria bacillus has been mentioned by other workers, notably Park, in his textbook on bacteriology. Gram's method of staining, however, will differentiate these organisms, since the *Bacillus pyocyaneus* is gram-negative and *Bacillus diphtheria* gram-positive. *Pyocyaneus* is easily cultivated, and produces a characteristic blue pigment on suitable media.

Since the original report of a case of this kind in this country in 1924, there have appeared at various times in the literature descriptions of instances of the disease known as agranulocytic angina. The finding of the *Bacillus pyocyaneus* in these cases has been by no means constant.

E. C. Piatt,[3] in a report on the histopathology of agranulocytic angina, discovers in the lesions found in the disease a gram-negative bacillus of which he has to say: "If they belong to the *Bacillus pyocyaneus* species, they must possess some peculiarities in their biologic properties."

Henry S. Weider [4] reports a case in which the patient suffered two attacks, the second one fatal. The *Bacillus pyocyaneus* was not mentioned.

R. J. Hunter,[5] in 1926, reports a case following a fractured tibia. He reports cultures from the lesions as showing only the usual flora of the mouth.

Harold P. Hill [6] of San Francisco has recently reported a case of so-called agranulocytic angina, following the extraction of teeth, in which the *Bacillus pyocyaneus* was sought for and not found, but in which, on account of the blood pictures, the diagnosis of agranulocytic angina was made.

Recently we have had occasion to see a case similar to the last one mentioned. Following the extraction of a number of teeth in a middle-aged woman, she developed a gangrenous process in the mouth and nose. The total white blood count was 1400, with but 3 per cent of granular cells. The blood picture persisted throughout the febrile course of the illness, which lasted for two weeks. The white count gradually resumed its normal proportion and number. Smears from the mouth and nose failed to reveal the presence of the *Bacillus pyocyaneus*. The woman recovered.

On the contrary, Doctors Hammack and Zeiler have recently had occasion to follow still another case of ulcerative stomatitis in a middle-aged woman, in which the white blood count was 2400, with 19 per cent of granular cells and in which the *Bacillus pyocyaneus* was recovered in pure culture from the mouth lesions. The woman died.

Clinically this last case, and the one described in detail earlier, seem to fall in a definite group identical with the ones described in Germany in 1923, and the one case reported by Lovett in this country in 1924. It resembles the so-called cases of agranulocytic anginas described by Piatt, Weider, Hunter, and Hill, insofar as the blood picture and mouth lesions are concerned, but differs from them in the important details that it always occurs in middle-aged women; it is apparently associated with the *Bacillus pyocyaneus,* and it invariably terminates fatally.

It would seem then that one must distinguish between two manifestations of the same disease. Agranulocytosis may occur in any severe stomatitis; it may occur in either sex or at any age. It may be associated with a stomatitis caused by any of the pyogenic organisms. Such cases are not necessarily fatal. Into this group fall all the so-called agranulocytic anginas.

As a subdivision of this class, and one which seems to present more or less of a clinical entity, is suggested that group of cases which apparently occur only in middle-aged women; which in the cases so

far reported have proved fatal and in which the *Bacillus pyocyaneus* has been recovered in pure culture from the typical lesions. For this particular picture is suggested the name "Pyocyanic Stomatitis with Agranulocytic Leukopenia."

523 West Sixth Street.

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SLOUGHING OF THE URETHRA FOLLOWING THE USE OF A 10 PER CENT SOLUTION OF ACRIFLAVINE

CASE REPORT

By WALTER G. SCHULTE, M. D.
Salt Lake City, Utah

A YOUNG man of 23 presented himself with the following story: Exposed to venereal infection two weeks ago. Three days later there was burning on urination with a slight discharge. A diagnosis of acute gonorrhea was made and he stated that a 10 per cent solution of arciflavine was prescribed. He was told to inject the solution into the urethra three times daily and retain it for five minutes. Injections were very painful, and intolerable after the third day. The medicine was then diluted with an equal quantity of water. Injections were still very painful and urination became difficult, so he discontinued injections and consulted a druggist, who referred him to me.

Physical examination revealed a swollen penis with a yellow necrotic mass 3 mm. in diameter protruding 2 mm. from the urethra. Inguinal glands slightly enlarged on both sides and very tender. No other lesion about the genitals. Urethral smear negative for gonococci, but there were many pus cells. Urine, first and second glass cloudy, third clear. Wassermann negative.

Treatment—Penis immersed in a hot solution of potassium permanganate 1:10,000, once daily for one-half hour. Then 10 per cent calomel ointment dressing. Internally one-half grain of acriflavine in tablet three times daily after meals.

After ten days the slough separated, and it was found to be a cast of the urethra 2 cm. in length. Sounds were introduced every other day. Healing progressed very nicely, and on discharge June 6 there was only a slight stricture of the anterior urethra, 22 French, with normal prostatic secretion. No urethral discharge. Urine clear.

Comment—Acriflavine in 10 per cent solution acted as an escharotic producing sloughing of the urethra. The resulting stricture was much less than one would expect. Needless to say the tissues may continue to contract with complete occlusion, but the urethral mucosa was soft and showed little thickening at the time he left for another state.

612 Boston Building.

Medicine: Its Accomplishments and Its Needs—Jabez N. Jackson, Kansas City, Missouri, in the President's address delivered before the American Medical Association at the seventy-eighth annual session, Washington, D. C., May 17, 1927, says: It is a great privilege to have lived in the present generation. Within its span more has been added to the sum of human knowledge than in any previous period of the world's history. The Golden Age it has been called—the Age of Science. Discovery after discovery has followed in such rapid sequence that the mind of ordinary man is awed with amazement. Fundamental principles of science, slowly comprehended through long periods of time past, have suddenly found practical application beyond even the vision of the dreamer. In the fields of medicine the workings of science have been none the less remarkable, though less obvious to the general eye. When the microscope first enabled us to comprehend the fundamental cellular structure of the body, the key to the ultimate interpretation of life was put in our hands. When Pasteur discovered the existence of other cellular organisms capable of attack on human cells, he gave to our science its first knowledge of the essential cause and nature of much of disease, and the new science of bacteriology was born. Through it pathology found a new interpretation and became a vital study. The culture tube and the reagent brought chemistry into the field, and through the three the laboratory became the center of medical investigation. Brief though the span since the birth of these sciences, their contributions to human welfare have been numerous and of value inestimable. The knowledge of how to prevent many diseases has alone saved to the world countless lives and immeasurable expense. Cholera, which once with its death scythe stalked through nations, has become now but a name. Yellow fever, which almost annually gleaned its thousands of human lives and paralyzed commercial activity, has been driven to the far recesses of Africa, where the few cases reported in the past year evidence its dying gasps. The sanitary control of malaria and other infectious fevers made effective by Gorgas built the Panama Canal and rerouted the commerce of the world. The curative contributions of medical and surgical science have been no less notable, though obviously less noted. The paths of progress have been fairly well blazed, but progress must be ever onward. The laboratory, the hospital and the opportunity for cooperation become henceforth the prime problems of medical practice. County or local hospitals are becoming more numerous year by year. Modern hospitals with laboratories and trained assistance cost money. Forty years ago an endowment of $5000 was adequate to provide for the support of one bed of hospital service constantly occupied for a year—$300 a year. Today the cost of care of a patient in a city hospital ranges from $4 to $8 a day. This does not include the expense of special nursing or other services of like nature. It does not consider the doctor's service at all. The hospital is the outgrowth largely of a new and scientific medicine. Its necessity and its importance to the community must likewise become generally recognized. If proper character of medical service is required in any community, adequate facilities must be offered to attract proper medical talent to a place where it can render the service to which it has been educated. In this way and in this way alone can rural counties solve the problem of their adequate medical service. For the protection of the middleman, endowment is a necessity—endowment that will at least provide for the expense of purely scientific service, a service which in itself has no direct return; endowment that will equip adequate modern laboratories such as proper service demands; endowment that will provide at least modest compensation for the purely scientific laboratory expert who has no other source of remuneration and yet whose aid is a necessity to all who practice; endowment that will meet the expense which the "Generation of Science" has brought to medical service.—*Journal A. M. A.*

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An open forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects and discussants invited. Useful extracts from letters will be published.

WHAT ARE THE ESSENTIALS IN POST-OPERATIVE CARE OF PATIENTS AFTER EXTENSIVE BONE SURGERY?

Ernest W. Cleary, San Francisco — The trauma and shock-productive manipulations of major bone surgery make postoperative care a serious consideration. This observation applies with double force to accidental injuries extensively involving bones.

An experienced nurse constantly at the bedside, with judgment enough to handle her patient intelligently and to recognize the early evidence of impending complications, is more than half the battle. She should be fortified by the surgeon's written orders.

Before the patient leaves the surgery, a gastric lavage with a gram of soda bicarbonate in six or eight ounces of water left in the stomach alleviates nausea and thirst.

If much blood has been lost, normal salt solution by hypodermoclysis or intravenously is advisable. In some cases the Murphy drip is of advantage.

Immobilization of the operated part should be adequate, not only to prevent distortion, but to minimize pain, shock, hemorrhage and delayed healing. Asepsis is relative, practically never absolute, and immobilization helps absorption of contaminating organisms and sharp localization of infection if it occurs.

"Heat is life; cold is death," said a noted professor of surgery as he gave instructions for keeping the postoperative patient warm. Put warm garments on the patient before he leaves the surgery. Have his bedding and room thoroughly warmed and kept warm and well ventilated throughout the critical postoperative period.

Water should be given frequently, in small quantities, as soon as the patient can retain it. The writer believes that patients freely supplied with alkaline mineral water get on better and are more resistant to infections. Routine use of liquid petrolatum facilitates bowel elimination. Enemata are preferable to drastic catharsis. Catheterization if necessary should be done only by an attendant competent to avoid infection. Feeding should begin with liquids the morning after operation, if the patient is able to retain food and desires it. Wait till the patient wishes to eat. Soon he should have food which requires mastication. The gastrointestinal tract is thereby encouraged toward normal activity.

Stimulants are practically always contraindicated. A patient may remain for hours in a very low state, respirations shallow, heart action feeble and extremities cold, and yet recover uneventfully if kept warm and quiet and not stimulated. This miscalled "sinking spell" in such a patient is more often a beneficent reaction which conserves vitality. Inexperienced attendants, unaware of the significance of this reaction, fearful of opiates and ignorant of the effects of narcosis in such cases, are prone, by the same token, to be too ready with dangerous and contraindicated stimulants. Caffein, strychnin or other powerful stimulant may fatally spur a body which has need of and is trying to rest.

Narcotics, judiciously used are a strong support. Morphin sulphate is the safest and surest. The patient is best kept well under its influence during the first three days at least. A young adult may require as much as one-fourth grain every four hours; children and the aged proportionally less. The slow respirations and contracted pupils, indicative of deep narcotization, are too easily recognized by the experienced to make overdosage an imminent danger. The patient should never at this stage so lack the narcotic as to become restless and to suffer severe pain. The dose may be tapered off rapidly in frequency and quantity, and discontinued within a week. Bromides or mild hypnotics may be used as the opiate is withdrawn. Morphin properly administered induces semisuspended animation similar in some respects to hibernation in animals. It aids the natural reaction and the patient dozes toward recovery with a minimum expenditure of energy. Morphin does not depress the heart. Respiratory depression, due to morphin, is easily kept within control by intelligent administration. In fifteen years of practice the writer has not seen a patient in serious danger from morphin given by the surgeon's orders. He has several times seen disaster from failure to use it. Not a single instance is recalled of morphin habit developed from postoperative prescriptions. Morphin does constipate and may interfere temporarily with voluntary emptying of the bladder, it does mask symptoms, it sometimes nauseates, and very rarely a patient with an idiosyncracy may be excited or too deeply narcotized. All the objections to and shortcomings of morphin pale into insignificance compared to the signal service which it renders the patient in his extremity.

* * *

N. T. Enloe, Chico—The postoperative care of a patient depends largely on the location of the surgery done, the amount of injury necessary to the parts in performing the operation, the condition of the wound as to sepsis or asepsis, and the skill and care of the surgeon.

Should the wound be an infected rather than a clean one, the postoperative care should begin in the surgery. Clean the wound thoroughly with iodin neutralized with plenty of alcohol. Keep the wound full of ether when closing. Use no larger drain than

is absolutely necessary, and place it at the most dependent part.

If the wound is not infected it is not necessary to make it so. Most cases become infected from the skin, this infection being carried with perspiration even after the most careful preparation has been made. Avoid this infection by painting the field of operation with tincture benzoin compound two or three times and allowing it to dry thoroughly before beginning to operate. This is a strong antiseptic. It forms a coating on the skin and prevents the perspiration. The use of towels is to be condemned. They are in the way of the surgeon, and are no barrier to perspiration, which, when mixed with blood, is carried into the wound.

After skin incision is made, change to a sterile knife and fill the wound with tincture benzoin compound.

The doctor's orders must be carried out, as Doctor Cleary suggests, by an experienced nurse of good judgment, and the patient kept quiet. The use of suggestive therapeutics is very important at this time, for practically all cases of shock are the result of fright and not of surgery. Should shock occur, and even should it be surgical, suggestion, good nursing and absolute quiet for the patient usually give the best results. A horse, worn out, nearing the end of a long journey, might reach home by careful persuasion. But one lash of the whip, although it spurs him on for the time, might cause him to fall never to rise again. It is the same in shock. Apply a stimulant. The patient may rally for a short time, but later collapse after this energy is spent and never be able to come back.

I never use gastric lavage. If a physic is given forty-eight rather than twenty-four hours prior to the operation or not given at all, I find very little nausea.

If the operation is necessary as a result of an injury, usually shock, loss of blood and severe pain follow. The shock generally subsides as soon as the patient's confidence is gained. If blood is lost to the point of danger, it should be replaced by saline, preferably by rectum, 2 to 4 ounces, as often as the patient can retain it. In extreme cases use saline intravenously or by hypodermoclysis. The annoying effect of the Murphy drip on the patient has caused me to abandon it.

Immobilization is imperative in all cases. It is conducive to the best possible function after recovery, lessens the irritation which, in turn, lessens the hemorrhage, encourages better circulation, hastens absorption, lessens pain, and promotes more rapid healing.

Heat is applied when indicated by means of hot blankets, etc., but never by hot-water bottles unless we are sure there is no nerve injury or that the vitality of the patient is not so lowered that the heat applied may result in a burn which would not occur under normal condition.

Pain, if severe, should be kept under control by a narcotic, preferably morphin. In cases of idiosyncrasy I have had good results and no depressing effect by the use of 10 grains of aspirin by rectum.

The alimentary canal should be kept clean by the use of mineral oils or by vaseline made palatable.

I believe that a great many of the postoperative complications in bone surgery can be prevented by proper care in the surgery.

* * *

Robert T. Legge, Berkeley—A greater emphasis should be placed upon the preoperative conditions of each particular case. After exercising the most careful judgment in studying the clinical history and laboratory findings and in making an early diagnosis in the case of bone tumors and osteomyelitis; after using roentgenography at various planes so as not to overlook any pathology; after avoiding the use of hardware in fractures; after debridement in the case of destructive injuries to soft parts and using ultra asepsis in the preparation of the patient for operation; after exercising due respect for the tissues in the field of operation (since primary healing, shock, and hemorrhage are proportionate to the tissue trauma); after routine drainage of all wounds that have any semblance of infection, the postoperative care of extensive bone injuries will be minimized. The after care will consist of rest and scientific nursing, and the patient's hospitalization will be markedly curtailed.

It is certainly a fact that failure in bone operations and anxiety of the surgeon in the postoperative treatment are principally caused by failure to satisfy the necessary biologic, physiologic, and mechanical requirements.

In bone surgery, whether it be due to disease of the structure or to traumatism as in fractures or joint involvements, the surgeon is dealing with hard tissues that require a longer period of convalescence. It is therefore important to use the utmost care to prevent infection. Careful preparation of the site of operation, the best aseptic operating room technique and the use of only sterile instruments in the field of operation are essential. If the asepsis has been perfect the after treatment of extensive bone surgery is absolute rest (secured by cast or Thomas splint), elevation of the part, careful nursing by a well-trained nurse and the prevention of shock, pain, and infection.

A comfortable bed fitted with a Balkan frame which permits easy adjustments and greater comfort to the patient, should be provided.

Should there be a rise in temperature concurrent with chill, followed by sudden elevation of the leukocyte count, the wound should be opened and pus found in the wound or under the periosteum should be drained. Tapping of the bone to allow the escape of pus and to divert the lymph stream away from the circulation may be necessary. If carefully drained and compressed with sterile gauze dipped in boric acid solution and alcohol, the dressings kept warm by means of an electric light over them, and changed frequently, much relief is afforded and progress in regeneration made. The Carel Dakin technique offers excellent results in the treatment of infected bone and soft tissues.

Where suppuration persists, one must always bear in mind a possible sequestrum of bone or other for-

eign body which requires removal. To promote the closing of the fistula, quartz light, heliotherapy or open-air method favor healing. Vaccine therapy has been advocated, especially by some of the European surgeons.

At the earliest possible opportunity physiotherapy should be established to promote function by the use of massage, diathermy, and other mechanical measures.

Lastly, a careful examination of the chest should be a routine measure to determine the presence of pulmonary metastases in a suspected osteogenetic sarcoma, as such findings may be present without any symptoms suggesting such a complication.

* * *

Charles E. Phillips, Los Angeles—These may be considered under two classes: first, general; and second, local. Doctor Cleary has covered, in an admirable manner, the general treatment to be followed.

There is a wide variation in the local treatment of these cases. Many surgeons attribute their successes or failures to some detail of postoperative treatment. Postoperative accidents to the field of operation may be mechanical or infective.

Mechanical accidents may be classified: weakness of operative structure; hemorrhage, either interstitial or as hematoma; myositis or neuritis due to pressure.

Infective: These complications may arise from metastases from foci elsewhere in the body, by stirring up latent infection in compound wounds, even after years have elapsed, retrograde infection from a moist skin, or most frequently from an imperfect operative technique. Postoperative care must be individualized.

While an absolute aseptic technique is theoretically impossible, yet it may be approximated so closely that contamination almost never occurs.

The treatment should be individualized by classifying the risks. Excellent surgical risk should show an incidence of contamination of well under 1 per cent. Fair surgical risks, such as those in which there are foci of infection removed from the site of operation or other conditions lowering resistance.

Careful attention to the reaction and continuation or elevation of temperature beyond the normal should be followed by a careful and frequent inspection of the wound.

If the wound appears abnormal it should be opened. On opening a wound, smears and cultures should be taken routinely.

When infection is demonstrated the wound should be opened widely and Dakin treatment instituted thoroughly. It is by this means that the benefits of the operation or even the patient's life may be conserved.

In poor surgical risks, by reason of local infection or other causes, the immediate postoperative use of the Dakin treatment is indicated that the benefits of the operation may be accomplished. I have effected healing in old fractures complicated by osteomyelitis by a two-stage process. I first uncover the cavity to its fullest extent and, by the use of Dakin treatment, produce a relative sterilization of the cavity, i. e., until no bacteria are apparent on smears. A pedicled bone transplant is then placed and caused to heal under a continuation of the same treatment.

In conclusion: The postoperative treatment of extensive bone surgery must be individualized to obtain the best results.

Rose Bengal Test for Liver Function—N. N. Epstein, G. D. Delprat, and W. J. Kerr, San Francisco, describe a simplification of the technique of the rose bengal test, and review briefly the types of liver injury which may be revealed by a test of this kind. The technique described differs quite markedly from the original technique and offers the advantages of simplicity and accuracy. The artificial standard, made up by adding a known quantity of dye to the normal plasma of each individual has been abandoned, and a two-minute sample is substituted as the standard. The other essential changes in the technique have been the elimination of the four-minute sample, which does not give information of value, and the prolongation of the duration of the test from eight minutes to sixteen minutes. This increased length of time of observation lends more accuracy to the test and has the advantage of giving more information when the eight-minute reading is at the borderline between normal and abnormal. Normal persons absorb rose bengal through the liver from the blood stream very rapidly so that at the end of sixteen minutes only a trace remains in the blood plasma; that is, rarely more than 25 per cent of the amount injected. In chronic cholecystitis the elimination is usually within normal limits, and the test is not an aid in the diagnosis of the condition. In cases of obstructive jaundice, catarrhal jaundice and arsphenamine icterus, the delay in the elimination of the dye is always very definite, being greatest in obstructive jaundice. The test is a valuable aid in detecting these conditions and in following their clinical course. Before the jaundice begins to clear clinically, the improvement in liver activity can be demonstrated by its increased ability to eliminate rose bengal. Following operations for the relief of obstruction of the common duct, the liver function improves markedly. The test may be used as an aid in determining the potency of a cholecystoduodenostomy, as the dye can be readily identified in the duodenal contents. It has proved very valuable in following the course of an arsphenamine hepatitis. In cirrhosis of the liver the impairment of liver function is in direct relation to the amount of scarring in the liver and to the encroachment on the functional reserve of the liver. An advanced case of cirrhosis always shows a marked delay in the excretion of rose bengal. The test is of particular value in the differential diagnosis when ascites is the outstanding symptom. In cardiac failure, in tuberculous peritonitis and in carcinomatosis of the peritoneum, little change from the normal liver function has been noted, while on the other hand, when cirrhosis of the liver is present, there is a very marked impairment of liver function. In metastatic malignancy of the liver the conditions are variable and seem to depend on the amount of liver tissue which can function. Discrete scattered metastatic nodules in the liver do not interfere with its ability to eliminate the dye, but diffuse replacement of the liver tissue by carcinoma very definitely causes a retention of the dye in the blood stream. Chronic passive congestion of the liver does not seem to prevent the absorption of rose bengal, and the curves are within normal limits. Long-continued treatment with arsphenamine and mercury does not disturb the liver activity. Arsphenamine dermatitis unaccompanied by icterus shows elimination of rose bengal within normal limits. In general, it may be seen that the rose bengal test for liver function gives results in direct proportion to the clinical and pathologic data noted in regard to the liver.—*Journal A. M. A.*

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Contributions—Exclusive Publication—Articles are accepted for publication on condition that they are contributed solely to this journal. California and Western Medicine has prepared a leaflet explaining its rules regarding publication. This leaflet gives suggestions on the preparation of manuscripts and of illustrations. It is suggested that contributors to this journal write to its office requesting a copy of this leaflet.

EDITORIALS

TYPOGRAPHICAL CHANGES IN CALIFORNIA AND WESTERN MEDICINE

This July number of CALIFORNIA AND WESTERN MEDICINE is the beginning of volume twenty-seven of this journal. It seemed a fitting number in which the editors might institute certain changes in the typographical make-up, which they have had under consideration for some time.

In this number the table of contents will be printed on the front cover, so that our readers will be able to tell at a glance, and without seeking elsewhere for the index, just what fields the contents cover, and where any particular items in the journal may be found.

In this index, what may be construed to be the major departments of the journal, are printed in capitals. The relative position of these departments, it is hoped to keep the same in succeeding issues. The thought in all of this has been to make it as easy as possible for readers to become acquainted with the general contents of our official publication and, with a minimum of effort, to be able at all times readily to find special and routine information.

The biographical sketches of contributors have been discontinued. It was felt that these could be found to better advantage in other publications; the thing in which our journal was primarily interested, being not the biographies but the presentation of the work of the contributors.

Specific references in the text of an article will be acceptable. Today the complete indices which are printed by other publications enable medical libraries to prepare bibliographies on any subject, for all who wish to do collateral reading. Printing in CALIFORNIA AND WESTERN MEDICINE, what are at best only partial bibliographies, would not add materially to the scientific value of the contents of this journal. The money expense involved in the printing of bibliographies can be used to better advantage in the development of other features.

In the advertising pages, the directories of the state and component county units have been brought forward to the first pages; likewise, the classified or reading notice advertisements. The Physicians' Directory, which has heretofore been printed in the advertising pages, will be discontinued, as per instructions from the Council; the contracts not being renewable, and all whose cards appear therein, and who so desire, being permitted to withdraw their announcements at once.

Throughout the pages of the journal other minor alterations have been made, which it is hoped will meet with the approbation of the readers. If some of the changes instituted are found in practice not to be improvements, then such will be discontinued.

Suggestions from readers for improvements in CALIFORNIA AND WESTERN MEDICINE are always welcome, and will receive careful consideration by the editorial board.

THE FLEISCHNER ENDOWMENT FUND

If the medical profession ever expects to earn the full respect of the people, it must first prove that it respects itself. Physicians abroad have long realized this fact and have seen to it that, insofar as possible, their confréres, living and dead, have received public recognition. How strangely this contrasts with our American and, more specifically, with our California custom.

A visitor to almost any city in Europe will find institutes of research, hospitals, yes, almost each ward, operating room and laboratory, perpetuating the memory of some noted physician, who usually at some time or other had worked there or whose achievements in other parts, in the opinion of the local profession, merited recognition.

In this state our schools are named for our great statesmen, sometimes for some of our great educators, and occasionally for some of our public-spirited citizens or merchant princes. Very few public hospitals are named for doctors. Why are they not so named? Would it not be practical to name each ward in every public hospital for some eminent physician? It may be argued that in America we have no Pasteurs, no Listers, no Virchows, no Laennecs, etc. But if we have had no stars of the first magnitude, let us at least perpetuate the memory of the lesser lights until we can replace them by the greater ones later.

In San Francisco, with this in mind, and with a desire to perpetuate the memory of the late E. Charles Fleischner, a group of physicians have started "The E. Charles Fleischner Endowment Fund for the Study, Prevention and Treatment of Communicable Diseases in Childhood." To physicians one need not detail the importance of such

an endowment fund, the income from which may be applied, without a lot of red tape, to the study of such diseases as measles, scarlet fever, mumps, whooping cough, diphtheria, poliomyelitis, etc., to their prevention whenever and wherever possible—and also when necessary, directly to their treatment.

In San Francisco the public is being educated to this need. Fleischner's friends—and these include his confréres and all his former patients—are sending in their contributions. The work is just started. No public drive or campaign is being held. Subscriptions are all voluntary. The more the public realizes what it is all about, the greater will the fund grow. Physicians throughout the state can help it grow, either by contributing directly, or having patients or interested persons send in their checks.

But remember, while this program may seem an ambitious one, it is but one move in what should be a greater effort to get an increased respect for our profession. In honoring one, we honor all.

HOSPITAL STAFF AND COUNTY SOCIETY MEETINGS

A few years ago hospital staff meetings were the exception. Now they are the rule; so much so that the majority of standardized hospitals demand a certain percentage of attendance at the regular staff meetings. In smaller communities where there are only one or two hospitals, and where there is no great division of the activities of component county medical societies into section units or groups of specialists, these one or two additional hospital staff meetings per month mean no special hardship. In the larger cities, however, where men are on the staffs of one to five different hospitals, each demanding a certain amount of obligatory attendance at staff meetings, the situation is otherwise. Here the staff meetings, on top of a multitude of medical society and other conferences, really at times get on the nerves of the hapless physician members. More than ever before, they find themselves spending their evenings away from their homes and families, and not in attendance upon patients, but only in professional conferences with colleagues. So aggravated has the condition become for many men, that a goodly number of colleagues have come to the conclusion that they are not much better off mentally than are athletes physically who have been overfed and overtrained. The evil just noted gives no promise of betterment, the reverse being rather the case.

Overlapping on County Society Programs

A second evil, and one that particularly affects organized medicine, not infrequently results when at such hospital staff meetings, scientific programs are presented that are in many respects either an encroachment, or a duplication on the type of programs which have long been covered by county medical societies and their subordinate units. When programs of the county society type are presented by hospital staffs, they fulfill no special function and perform no particular benefit for their respective institutions. As a matter of fact, because the smaller number of physicians who attend such institutional conferences do not represent a true cross-section of the professional body of the community, they really become a detriment and can only develop into a menace to the best interests of organized medicine. So often has this error been committed by hospital staff program committees, that warnings have been sounded by the national organizations having to do with hospital standardization; and the defects and dangers of such a procedure in staff meetings have been very pointedly indicated. In most instances, when this unfortunate overlapping has taken place, the sin has been one not of commission, but one of omission; or rather it has been a sin of not having a proper appreciation of what a staff meeting program should best cover, and the means by which the objects desired might be best attained.

True Scope of Hospital Staff Meetings

Without going into details concerning every one of the many phases of the art and science of medicine which could be discussed at a meeting of physicians and surgeons, it should suffice to state that the hospital staff meeting should limit itself strictly:

1. To a consideration of the professional work done in its own institution;

2. To a consideration of ways and means whereby every phase of administrative and professional activity within the institution may be improved; and

3. To a consideration of those matters having to do with hospital activities in general, the discussion of which would make for a betterment of hospital facilities in that particular community and in the state and nation.

Or to put it otherwise, and somewhat in reverse form, the consideration of all other phases of the art and science of medicine not included in the foregoing, in every community, might well be left to those expressions of organized medicine which form the very bulwark of all organized and scientific medicine, namely, the county medical society of that community, and its state and national medical associations.

A Successful Staff Meeting Method

In one of the hospitals with which the writer is connected a staff organization and meeting procedure has been worked out in the last several years that fulfills, we believe, the real purpose of a hospital staff organization, and this without infringing on the pre-existing or proper domains of other medical organizations.

In this hospital of over three hundred beds there is not an overplus of staff meetings, there being only one such session per month. Provision is made for extra meetings, but these are rarely called.

There are three to five presentations of history records of patients who have been under care at the institution. The history records selected by the program committee, after conference with the chart reading committee, are of that kind, wherein matters of diagnosis, treatment or pathology especially come into question; or which, for this, that, or the

other reason should be of particular interest or value to the staff members.

The presentation of the history record is kept as impersonal as possible. This impersonal element is very important. The clinical history, with case number, but not the patient's name mentioned, is compiled and read by one of the interns, who writes up the same from the history sheets. The name of the attending physician or surgeon is not known or mentioned, and the members of the staff do not know whose patient is under discussion unless the attending physician or surgeon chooses on his own account, before the discussion closes, to make a statement that acquaints the staff members with that fact. This presentation by an intern gives very good training to each house physician; means as a rule a presentation that is more pointed and more unbiased than if the attending man was making it; and the system whereby the name of the attending man is not known permits the later discussion to proceed freely, and without engendering misunderstandings.

The program committee deputizes three members of the staff to open the discussion. Each of these, when he is notified that he is down for a discussion, is given a copy of the synopsis that has been previously prepared by the intern, and is told what particular phase of the general subject having to do with the disease under consideration, or any particular phase of the patient's clinical record, is to be discussed by him. Thus this plan provides that the discussion is opened by three staff members who are given specified topics, so that there is a minimum of overlapping; each of these discussors having had an opportunity to consider the complete history of the patient as compiled, and be in a position to give a more logical and pointed expression of viewpoint, than would be the case in a haphazard general discussion without previous thought on the subject.

After the presentation of the viewpoints of the three discussors, the subject is thrown open for general discussion.

The plan above outlined is a simple one. It may be said for it, also, that it works out well in practice. It makes for a thorough analysis of interesting case histories, and lays the foundation for keen and discriminating discussions on scientific topics and experiences that are of pertinent interest to physicians bound together in a staff organization.

* * *

These meetings start promptly at 8 o'clock, and an attempt is made to close them promptly at 10 o'clock. At the end of the scientific presentations, the superintendent of the hospital is usually called on for remarks and for questions. The minutes of the scientific meetings aim to be concise, and yet comprehensive enough to cover the major points brought out in discussion, and are read at the beginning of each meeting.

Not the least of the features in this particular staff organization is an informal luncheon, which is paid for from the staff treasury, but which is provided by the hospital authorities, and which follows immediately in informal buffet fashion at the close of the meeting. In this particular hospital staff the members follow their two hours of scientific feast with edibles and fluids that refresh the physical body, and the meeting room becomes a buzz of pleasant discussion, laughter and exchange of fraternal greetings, for thirty or more minutes.

* * *

There may be other plans of carrying on hospital staff meetings, just as good or better than that which has been here mentioned; but this one we are familiar with, and have seen its gradual and successful development. Because of a long experience in organization work in medical societies, we are of the belief that its practical features lay the foundation for a sound method of procedure and good end-results. It will be a surprise to us if we find that it will be necessary to materially change the methods now in vogue. These methods are outlined in some detail, in the hope of bringing them to the attention of staff groups who may have met with some of the troubles that have come to many hospital organizations, and who may not be familiar with the procedures here enumerated.

EFFECTS OF ELECTRICAL CHARGE ON THE FILTERABILITY OF MICROORGANISMS AND NEUROTOXIC DRUGS

Bacteriologists are at the present time particularly interested in filterable viruses, microorganisms that readily pass through the pores of a Berkefeld filter. Smallpox, rabies, and several other important human diseases are caused by such viruses. It is generally assumed that filterability is due solely to the minute size of the causative agents in these viruses. That minuteness of size, however, is not the sole reason for their filterability is shown by recent work by KRAMER [1] on the effects of the electrical charge of filters on the passage of microorganisms, microbic products, and neurotoxic drugs.

The filters commonly used in bacteriological work are composed of some form or compound of silicic acid, such as sand, porcelain or diatomaceous earth. Siliceous filters all have a definite negative electrical charge. Basic dyes (e. g., victoria blue) will not pass through negatively charged filters, while acid dyes (e. g., congo red) are readily filterable. A filter with a positive electrical charge is readily constructed from plaster of paris. Through a plaster of paris filter the above relationship is reversed, victoria blue being filterable, while congo red is held back. An electrically neutral filter may be made by mixing siliceous material and plaster of paris. Through a neutral filter, both victoria blue and congo red are filterable.

KRAMER found that vaccine virus, the virus of rabies, and other viruses that readily pass through a negatively charged Berkefeld filter will not pass through a positively charged plaster of paris filter. Bacteriophages and bacterial toxins are also generally held back by gypsum filters. Narcotizing drugs are usually removed from a fluid by passage through positively charged plaster of paris, but readily pass through negatively charged siliceous material. With spasm-producing drugs this relationship is reversed.

The effects of the electrical charge of filters, therefore, is not only of theoretical interest to bacteriologists, biochemists, and physiologists, but promises results of hygienic, therapeutic and commercial importance.

1. Kramer, S. P.: J. Infec. Dis., 1927, 40, p. 343.

MEDICINE TODAY

Current comment on medical progress, discussion of selected topics from recent books or periodic literature, by contributing editors.

Urology

Ureteral stricture and ureteral kinks have become recognized as definite pathological entities. The former condition was worked out at length by Hunner,[1] and although at that time his views were not widely accepted, all authorities agree now that this condition is the cause of much pathology in the upper urinary tract.

Inasmuch as the most common cause of urinary infection is obstruction in the urinary passages [2] it is logical to assume that infection in the upper urinary tract can be due to stricture of the ureter the same as a stricture of the urethra will cause infection in the bladder [3] This being true, it naturally follows that in any infection of the upper urinary tract, especially in the chronic or recurrent infections, the obstruction must be diligently sought, and in the absence of a calculus or other obvious cause of obstruction, such as pregnancy or pressure from extraureteral pathology, a ureteral stricture or kink must be either diagnosed or ruled out.

In addition to these cases of definite renal infection, ureteral strictures and kinks cause symptoms due to obstruction, in which there may be no infection present. The most constant of these symptoms is pain in the side. This may be either sharp or dull, and is felt anywhere between the ribs and the pelvis, anteriorly or posteriorly, and radiates to the groin or thigh.[4]

Bladder symptoms such as increased frequency of urination, urgency, dysuria and pain in the bladder is frequently caused by ureteral stricture or kink, and may or may not be accompanied by infection in the bladder.[5]

Gastrointestinal symptoms, chronic indigestion, nausea and vomiting, pain in the abdomen (especially in the epigastrium), and constipation, are common reflex manifestations of ureteral obstruction due to strictures and kinks of the ureter.[4] [5] [6] This explains the fact that most of these cases have been treated for everything from appendicitis to gastric carcinoma.

The diagnosis of ureteral kink is made by the pyeloureterogram, which shows the abnormal course of the ureter, the dilatation above the kink in the ureter, and in the kidney pelvis. Although the same method should be used in searching for ureteral stricture, too much dependence cannot be put in the findings of the pyeloureterogram, but should be supplemented by the use of the bulb. A "hang" is felt when withdrawing the bulb, the same as that felt when using a bulbous bougie in diagnosing urethral stricture.[3]

The treatment for ureteral kink is nephropexy, if support of the kidney with binders and corsets has failed.[4] Ureteral strictures are successfully dilated by the use of bougies and bulbs. In addition to these methods of treatment any possible focus of infection must be sought out and remedied.[5]

From the foregoing it is evident that the possibility of a stricture or kink of the ureter must be considered, and either diagnosed or ruled out in all cases of upper urinary infection, or cases presenting pain in the side, bladder symptoms or vague gastrointestinal symptoms in which no definite cause for the condition can be found.

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1. The Diagnosis and Treatment of Obscure Cases of Pyelitis and Hydronephrosis, Internat. Clinics, 1912, IV, 22nd series.

2. Keyes Urology, 1924 edition, pp. 289, 316, 322.

3. Ureteral Stricture, by Hunner in "Cabot's Urology," 1924 edition, Vol. 2, p. 307.

4. Nephropexy for the Relief of Ureteral Kinks Associated with Ptosis, C. E. Burford, M. D. J. A. M. A., Vol. 88, No. 8, p. 541, February 19, 1927.

5. Stricture of the Ureter in Males, Nelse F. Ockerblad, M. D. J. A. M. A., Vol. 88, No. 8, p. 544, February 19, 1927.

6. Ureteral Stricture and Apparent Ureteral Stricture, Gerhard L. Moench, M. D., Urologic and Cutaneous Review, Vol. 30, No. 2, p. 649, November, 1926.

Laboratory Medicine and Methods

Blood Calcium Estimations—The most striking feature in the progress of present-day medicine is the application of physiological chemistry to the problems of disease, and particularly in relation to the ductless glands and their secretions. The control of the processes of nutrition by the internal secretions is reflected in the chemistry of the blood. The clinical laboratory methods of blood chemistry as devised by Folin, Benedict and others have given the physician an effective tool in the investigation and control of many conditions which before had baffled his best efforts.

Recently the importance of blood calcium and its control by the hormone of the parathyroids is emphasized by the preparation by Collip [1] and his collaborators of an active extract of these glands—parathyroid extract, Collip—which is available for clinical use, and in a form acceptable to the Council on Pharmacy and Chemistry of the American Medical Association. These workers have shown conclusively, what was before less definitely known, that the conditions resulting from experimental parathyroidectomy in animals and accidental surgical parathyroidectomy in man (the principal clinical manifestation of which is *tetany*, and which is reflected in the blood by extremely low calcium content), are completely prevented and controlled by subcutaneous or intramuscular injection of this extract.

The normal average of calcium is about 10.5 mgs. per 100 cc. of blood serum, varying within the

1. Collip, J. B.: The extraction of a parathyroid hormone which will prevent or control parathyroid tetany and which regulates the level of blood calcium. J. Biol. Chem., 63:394-438, March, 1925.

limits of 9 to 12 mgs. Values as low as 5 and 6 mgs. have been seen in the absence of the parathyroids. Conversely the administration of excessive doses of the extract to normal animals or those deprived of the parathyroids causes a rapid rise of the blood calcium to 20 mgs., with serious symptoms and death resulting from the hypercalcemia.

Other conditions definitely recognized as having a basis of hypocalcemia and remediable by parathyroid extract are infantile tetany, the real etiology of which is obscure; and one type of rickets in infants. The treatment of these cases as well as the parathyroidectomized cases must be controlled by blood calcium estimations. It is easily possible by overdose to produce a hypercalcemia, and values above 12 mgs. are undesirable, and above 15 mgs. may be dangerous.

According to McCann,[2] in addition to the conditions mentioned as essentially associated with low blood calcium and amenable to treatment by injections of parathyroid extract, any pathological condition in which blood calcium is abnormally low, is an indication for its administration. The problem of determining just what these conditions are and when they exist presents a large field for investigation, and it is being extensively cultivated. Some of the conditions recognized more or less definitely as belonging in this category are muscle cramps, nutritional unbalance in tropical peoples, sprue, bronchial asthma, chronic ulcers, dental caries, delayed union and non-union of fractures, gastric tetany (stated by Collip not to be associated with calcium deficiency), lead poisoning, severe nephritis, furunculosis. Clinical reports are made of symptomatic relief in various types of cases, without controlling by blood calcium estimations; these are practically valueless.

The present accepted technique is that of Kramer and Tisdall.[3] Collip [4] states that there are many chances of error in blood calcium determination, and that many reports made by laboratory workers are valueless on account of inaccuracies. It is possible for competent laboratory workers to become proficient in blood calcium estimations as they are in blood sugar and other blood chemistry methods; and the importance of this field of investigation and therapeutics is such that this procedure should be made available in many clinical laboratories.

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Neurosurgery

Localization of Tumors of the Spinal Cord—In marked contrast to tumors of the brain, of which only about 20 per cent can be completely removed, 80 or more per cent of tumors of the spinal cord are encapsulated extramedullary growths, which will not recur after extirpation. If the spastic paralysis resulting from compression of the cord has lasted three years, there is rarely any return of function. But paraplegias of many months duration are usually recovered from within a few weeks after removal of the tumor. Early diagnosis and surgical treatment therefore means the difference between complete recovery of function and a tragic permanent paralysis.

The surgery of tumors of the spinal cord dates back only to 1887, when a tumor was localized by Gowers and successfully removed by Horsley. Striking advances in our knowledge of the history and symptoms of compression of the cord have been and are still being made. The whole subject to date has been put in most clear and readable form in Elsberg's [1] book, based on one hundred cases which he personally studied and operated on.

The localization of tumors of the spinal cord is easier than that of tumors of the brain, because a growth cannot attain any considerable size in the spinal canal without compressing the cord and giving definite motor, sensory and reflex signs. A careful history and repeated neurological examinations will accurately localize the great majority. Many patients have intensification of symptoms and signs after a spinal puncture, manifested by increased paralysis, or by a higher and more distinct level of sensory disturbance. The examination, therefore, should always be repeated after withdrawal of spinal fluid.

The greatest difficulty comes in attempting to differentiate very early compression from degenerative changes in the cord which simulate tumor. Dynamic and chemical studies of the spinal fluid (Queckenstedt's and Ayer's tests), are of great assistance in the detection of early partial blocks in the spinal subarachnoid spaces. A new method of diagnosis and localization was introduced in 1921 by Sicard, who showed that lipiodol introduced through a needle at the cisterna magna would be arrested at the upper margin of the tumor, where it could be demonstrated by the roentgen ray. This method unquestionably gives a perfect visual localization in the presence of a block; but in such cases the localization can almost always be made without its use. It is irritative, and it is not absorbed in less than three years. But, more important, the lipiodol is not always arrested by a tumor. Babinski [2] and Guillain [3] have reported cases in which, after negative lipiodol tests, operations have disclosed tumors. Moreover, lipiodol sometimes shows a false arrest which has led to negative explorations. De Martel [4] has cited four such cases, operated on by him, in two of which the lipiodol localization was made by Sicard. Though the method is still sub judice, it has not lived up to the hopes which were aroused that it would, like cerebral pneumograms in tumors of the brain, localize the few tumors of the spinal cord whose level could not be determined by other methods.

E. B. TOWNE,
San Francisco.

2. McCann, William S.: Parathyroid Therapy. J. A. M. A., 88:566, 567, February 19, 1927.

3. Kramer, Benjamin, and Tisdall, Frederick F.: A simple technique for the determination of calcium and magnesium in small amounts of serum. J. Biol. Chem., 47:475-481, August, 1921.

4. Collip, J. B.: The parathyroid glands. Medicine, 5:1-58, February, 1926.

1. Elsberg, Charles A.: Tumors of the Spinal Cord, Paul B. Hoeber, Inc., New York, 1925.

2. Babinski, J., Charpentier, Alb., et Jarkowski, J.: Paraplégie crurale par tumeur extra-dure-mérienne à la région dorsale. Opération. Guérison. (Sur l'epreuve du lipiodol.) Rev. Neurol. 2:587, December, 1926.

3. Guillain, G., Alajouanine, T., Périsson et Petit-Dutaillis: Considerations sur la symptomatologie et le diagnostic d'une tumeur intrarachidienne de la région dorsale inferieure. Opération et guérison complète. Rev. Neurol., 1:11, January, 1925.

4. De Martel, T.: Discussion, Rev. Neurol., 2:444, November, 1923.

Nutritional Disorders

Surgery in Diabetics — Eliott P. Joslin has written on "Diabetic Surgery from a Medical Point of View" in the *Boston Medical and Surgical Journal,* January 27, 1927. This article will interest all members of the medical profession. He emphasizes the great need for cooperation between the internist and surgeon and the need for adequate laboratory facilities in order to protect the diabetic, mild or severe, for the surgical diabetic is always a serious diabetic. His statistics show that about one out of three diabetics require surgery eventually.

After the operation there is always the danger of acidosis or other complications. Joslin's statistics show that the mortality in surgical diabetics is strikingly high for his series of cases, even though the operations were performed with the patients receiving the best of care. Diabetes mellitus increases the mortality about six times, and therefore after operation these patients should receive six times the amount of care that the nondiabetic surgical case requires. The blood sugar should be kept at, or very near, normal by frequent small doses of insulin rather than by large infrequent doses, thereby maintaining a constant supply to the tissues and keeping a level blood sugar curve throughout the day and avoiding needless reactions or hyperglycemia part of the time. The carbohydrate intake should be adequate to avoid any tendency to acidosis and this need not be given as often as the insulin. Acidosis is easily preventable when the patient is closely watched.

Since diabetes apparently increases the development of arterial disease, the internist can aid the surgeon in the preoperative and postoperative treatment. Septicemia plays an important rôle in the cause of death, and the danger is heightened when there is insufficient treatment of diabetes. Tuberculosis must always be looked for and carefully guarded. It may develop most unexpectedly in the diabetic over 50 years of age as the lighting up of an old focus.

The incidence of gall-stones in diabetes is high, and the surgeon is a great aid in the prevention of progressive severity of the disease when he removes them. His task is a difficult one when he faces the added risk at operation, but this can be reduced to a minimum with the aid of the laboratory, and the knowledge of the internist whose constant contact with the disease makes the calculation of diets and insulin dosages problems requiring only a few moments to solve.

Surgery can increase the severity of the disease if the patient does not receive thorough care before, during and after operation. Thorough care is not difficult when the disease is known. If the patient is questioned as to the presence of polydipsia, polyuria, polyphagia, or glycosuria at any time—present or past—the urine examined, and, in questionable cases, glucose tolerance tests made, few diabetics will go undiagnosed.

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Tuberculosis

Intestinal Tuberculosis — Clinicians have long noted the frequency with which pulmonary tuberculosis is complicated by gastrointestinal symptoms. It is only within recent years, however, that an attempt has been made to investigate early secondary tuberculous lesions of the intestine looking toward their scientific study and treatment. This has been made possible by advances in roentgenological diagnosis, a method which has been admirably investigated by Lawrason Brown and Homer Sampson at the Trudeau Sanatorium. The conclusions reached by these authors are set forth in a small volume,[1] the first of a series of four Trudeau Studies, dealing with various phases of tuberculosis.

Brown and Sampson note that intestinal tuberculosis is the most frequent complication of pulmonary tuberculosis, not even excepting laryngeal tuberculosis. The "usual" symptoms are those that occur in the most advanced stages of the disease, namely, persistent diarrhea, abdominal pain, tender points in the abdomen, with or without rigidity, in the absence of an acute abdominal condition. "Suggestive" symptoms of beginning intestinal tuberculosis include, among others, any digestive disturbances, marked constipation, failure of the pulmonary condition to improve, an irregular temperature with subnormal fluctuations, and possibly decrease of pulmonary symptoms when the patient is not doing well, alternating constipation and diarrhea, and marked nervousness.

Thus, early in the disease the symptoms are seen to be largely "suggestive." The definite diagnosis rests chiefly with the roentgen ray. "General hypermotility, with complete or nearly complete emptying of the colon in twenty-four hours; failure of the cecum or of the ascending colon and hepatic flexure to retain the barium; or the presence of spasm or filling defects (irregular contour, lack of haustrations); or of confirmed segmentation, with or without dilatation or some coils of the small bowel; ileal stasis; and gastric retention are the essential points when the intestine is studied at the third to the tenth hours, and again at the twenty-fourth hour. These findings indicate ulceration only, but when pulmonary tuberculosis is present tuberculous ulceration can be safely diagnosed."

With proper treatment good recoveries are common. The ultra-violet rays and heliotherapy are the methods of choice, medical treatment being largely symptomatic and surgical interference disappointing. Roentgen ray treatment is also employed with encouraging results.

The frequency with which intestinal tuberculosis is encountered in persons with pulmonary tuberculosis makes a knowledge of the diagnostic methods now in use and a knowledge of treatment essential to all those dealing with pulmonary tuberculosis. Indeed, as Brown and Sampson remark, no moderately or far advanced case of pulmonary tuberculosis

1. Intestinal Tuberculosis: Its Importance, Diagnosis and Treatment. A study of the secondary ulcerative type. By Lawrason Brown, M. D., chairman of the medical board of the Trudeau Sanatorium, Saranac Lake, New York, and Homer L. Sampson, roentgenographer of the Trudeau Sanatorium, Saranac Lake, New York. Lea and Febiger, 1926.

can be assumed to have been thoroughly examined unless a roentgen-ray study of the bowel has been made.

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Ophthalmology

Medical Ophthalmology—Ophthalmology has often been regarded as an isolated specialty without a definite relation to general medicine, excepting in such cases where the fundi show signs of a kidney lesion, or in such diseases as goiter, where the eye signs are prominent. There are, however, a great many diseases in which the ophthalmological findings are definite and of real value in helping to establish the diagnosis. This is true of such diseases as those of the blood vessels (arteriosclerosis); blood diseases: pernicious anemia, leukemia, chlorosis, and others; disorders of the nervous system; nutrition and metabolism; specific infections; hereditary conditions; effects of drugs; parasites and other isolated diseases.

With the introduction of the electric ophthalmoscope, the examination of the eye grounds has become more or less a routine in all cases, so that the average fundus lesion is no longer a mystery to the general practitioner.

One difficulty with medical ophthalmology has been the lack of a ready reference book wherein were discussed briefly and concisely all the ophthalmological signs of general diseases. There have been several excellent books, but they have dealt with the subject in great detail and from an ophthalmological viewpoint. Recently Moore* has written a second edition of his book on Medical Ophthalmology. In this book an attempt has been made to give a concise account of those pathological conditions of the eyes which are of interest in general medical diseases. The changes are chiefly considered under the heads of separate diseases. In Chapter 1 are collected together for separate consideration a heterogeneous group of important ophthalmological signs and symptoms without special reference to the disease with which they are connected. The subsequent chapters are arranged to include systemic g ups, such as disease of the nervous system, toxic amblyopia and others. In the table of contents the arrangement is such that one can easily find the desired reference. The matter is fully discussed without the nonessential yet mentioning, the unusual that may occasionally be important. For example, in discussing Argyl-Robertson pupil the fact is also brought out that it sometimes occurs in cases where syphilis can certainly be excluded as the cause.

This book, then, gives a convenient reference on Medical Ophthalmology in which the eye findings can easily be correlated with the general medical examination.

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* Moore: Medical Ophthalmology, second edition. Blakiston's Son and Company, Philadelphia.

Physical Therapy

Hospital Control of Physical Therapy—It was not until the American Medical Association seriously considered the value of physical therapeutics in medical treatment and established the Council of Physical Therapy that the main portion of the regular medical profession paid more than a passing interest in its employment in practice. That commercially inclined individuals, urged on by the manufacturers of the various appliances, have reaped an immense financial benefit, is common knowledge. The unscrupulous persons have utilized, largely in a distorted way, methods developed by the pioneer group of physicians who have devoted and devised rational, scientific procedures by the use of water, massage, exercises, and electricity in the treatment of certain diseases and disabilities.

Mock,[1] chairman of the Council of Physical Therapy, in the following remarks, expresses a sensible attitude in which the profession should cooperate: "Physical therapy has come to the front so rapidly and with so much enthusiasm on the part of a great many of us that great care must be observed lest we go too far with it. I don't know whether it would be a good thing for every doctor in the country to have physical therapy equipment in his office or not after traveling around and seeing the way some doctors are using it. We must train a new tribe of doctors in the future who will know it just as they know how to give castor oil and strychnin. Then perhaps it will be safe. Today it is not safe for every doctor to have physical therapy equipment in his office. Physical therapy came into its legitimate place in medicine during the World War. Today it is gradually taking its place with the usual medical and surgical procedures. Unless we guard against allowing it to replace careful diagnostic measures, followed by well-defined but less spectacular methods of treatment, and especially unless we guard against its insidious tendency to make its master an easy living, physical therapy may lead into dishonest practice or quackery."

Granger[2] emphasizes the importance of hospital control, in part as follows: "A department of physical therapeutics is an economic gain to the community at large, and if not directly a source of revenue to the hospital, yet indirectly, by shortening their stay there, will permit a given number of beds to accommodate a larger number of patients and thus for all intents and purposes increase the bed capacity of the hospital without appreciable increased expense. Not only do the hospital and the community at large benefit from an economic standpoint, but also the patient, who is returned to gainful occupations without impairment of function."

The hospital is the logical place for the development and administering of physical therapy. Under its surveillance the various procedures can be rationally employed, patients receive adequate treatments, scientific investigation carried on and reliable knowledge acquired. Physicians requiring physical therapy assistants should employ only adequately trained

1. Mock, Harry E.: Archives of Physical Therapy Radium, December, 1926, pp. 748-50.

2. Granger, Frank E.: The Journal of the American Medical Association, March 12, 1927.

individuals, and never shift the responsibility of medical supervision. A properly equipped department of physical therapy, under medical supervision, in a hospital should render the best service to the patient, afford physicians the opportunity of obtaining a better practical knowledge of physical therapy, give the medical student a working conception of this branch of medical treatment and train technicians to administer efficient treatment under the direction of a regular licensed physician.

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San Francisco.

Dermatology and Syphilology

Calcium Therapy — Progress in therapeutics may follow one of two courses: discovery of new remedies or the more intelligent use of the old ones. New therapeutic agents, like new toys, are always more interesting than the old ones, yet the possibilities of many of the old remedies have by no means been exhausted.

This is exceptionally illustrated in the case of calcium in a recent paper by Roe and Kahn,[1] who show that food inhibits the absorption of calcium from the gastrointestinal tract. The value of calcium in the treatment of certain cutaneous disorders has been a matter of dispute for many years. C. J. White,[2] while admitting frequent failures, has been thoroughly convinced of its beneficial effects in chronic cases of urticaria, erythema multiforme, and several other conditions. A number of clinicians testify to its value in eczema.

The mode of action of calcium in those conditions which it is supposed to benefit has also been the subject of much debate. Earlier investigators were of the opinion that there was an actual deficit of blood calcium, with diminished coagulability of the blood. More recent studies, however, throw considerable doubt on both ideas. Schwartz and Levin [3] examined the blood calcium in a number of skin disorders, including urticaria, eczema, psoriasis, acne and furunculosis, and found the calcium to be within normal limits in all but a very small percentage of cases. In three cases of actinic dermatities, however, the blood calcium was distinctly low.

Pottenger [4] has emphasized some new ideas concerning the rôle of calcium in disease. He points out that certain pathologic conditions such as asthma, hay fever, urticaria, and eczema are accompanied by parasympathetic or vagus hyperactivity which occurs in the presence of a relative excess of potassium ions over calcium ions, and that the administration of an excess of calcium stimulates the sympathetic system with relief of clinical symptoms. This might answer the objection that the blood calcium is *quantitatively* normal in eczema and urticaria, since it might at the same time be *relatively* low as compared with potassium. This mechanism could also account for various exudative phenomena through action on the walls of the blood vessels or changes in the colloidal chemistry of blood or tissues. The subject is complicated, and our feeble knowledge of biochemistry and cell physics does not justify dogmatic assertions at the present time.

The importance of the observations of Roe and Kahn lies in the demonstration of the fact that optimum results from calcium therapy may be expected only when calcium is administered on an empty stomach. Conclusions based on small doses of calcium given either immediately before or immediately after meals are practically worthless. They show, for instance, that the administration by mouth of one single dose of 5 gm. of calcium lactate dissolved in water resulted in an increase of blood calcium from 9.8 mg. to 18.6 mg. in five hours, while in the same individual on another day, 55 gm. of calcium lactate given in 5 gm. doses in 250 cc. of milk for eleven consecutive hours resulted in a maximum rise of 12.5 mg. at the end of the eighth hour. In other words, 5 gms. of calcium lactate in water on an empty stomach caused a 91 per cent elevation of blood calcium in five hours, whereas eleven times as much calcium lactate given in milk produced only a 28 per cent elevation of blood calcium in eight hours. Their explanation of delayed absorption of calcium when given with food is that the food stimulates an outpouring of alkaline digestive juices in the duodenum which precipitates the calcium, thus making absorption of most of it impossible. Their observations include numerous determinations involving the administration of calcium lactate with foods of various kinds, all of which have an inhibitory action. They believe that 5 mg. of calcium lactate in water one-half hour before breakfast and three hours after the evening meal results in a prolonged elevation of the blood calcium fully as satisfactory as can be obtained by the intravenous administration and without any of the dangers.

With these three new ideas regarding calcium, (1) that a relative deficiency may exist in spite of a normal quantitative finding, (2) that the relative deficiency may exert a profound influence on the involutionary nervous system and possibly the colloidal structures of the tissues, and (3) that it is possible to effect a pronounced and prolonged increase of the blood calcium by oral administration of calcium lactate on an empty stomach—with these new ideas, an entirely new set of clinical observations should be compiled. In the light of these new findings it is to be hoped that many of the conflicting opinions of the past will give place to clean-cut certainties.

SAMUEL AYRES, JR.,
Los Angeles.

1. Roe, J. E., and Kahn, B. S.: Absorption of Calcium from the Intestinal Tract of Human Subjects, J. A. M. A., 88:980, March 26, 1927.

2. White, C. J.: The Use of Calcium Lactate in the Treatment of Certain Dermatoses, J. Cut. Dis., 32:691, October 14.

3. Schwartz, H. J., and Levin, O. L.: The Calcium Content of the Blood in Various Diseases of the Skin, Arch. Derm. and Syph., 10:544, November, 1924.

4. Pottenger, F. M.: Am. J. Med. Sc., 167:203, February, 1924.

Since its inception the Jackson Clinic has removed more than seventeen hundred foreign bodies from the air and food passages of sufferers brought to Philadelphia from every part of this country and more distant lands. Eighty per cent of these patients have been children, many of them at death's door.—*American Magazine.*

STATE MEDICAL ASSOCIATIONS

CALIFORNIA MEDICAL ASSOCIATION

PERCY T. PHILLIPS.....President
WILLIAM H. KIGER.....President-Elect
T. HENSHAW KELLY.....Vice-President
EMMA W. POPE.....Secretary-Editor

OFFICIAL NOTICES

Clinical and Research Prize Papers—How Such Papers May Also Be Read at Annual Session—All papers entered for a clinical or research prize and also entered in the Clinical or Research Prize Contest are eligible to be read at the annual meeting of the California Medical Association, providing the paper is received by the state secretary before December 20 of the year preceding the annual meeting and approved by the Program Committee. Conversely, papers written primarily for Section programs may be entered in the Prize Contest in the following way:

Send two copies of your paper to the state secretary, 1016 Balboa Building, San Francisco, before December 20, with an unsigned note that you wish your essay submitted for a prize and also read at the annual session. Sign your paper with your nom de plume. Also send your name in a sealed envelope with the nom de plume appearing on the outside. Use no stationery that in any way reveals your identity.

The state secretary shall deposit all nom de plume envelopes in a safe until the Prize Committee has made its decision.

The state secretary on receiving a prize paper which is submitted for presentation at the annual session shall submit said paper to the members of the Program Committee. The Program Committee will approve or disapprove it for place on the annual program. The Program Committee will inform the state secretary of its decision, and the secretary will then forward the titles of approved papers to the appropriate section secretary with a simple statement that the paper is acceptable for a place on the program. The Prize Committee will not be informed of this decision and action. A paper may be acceptable for a prize and not for a program, and vice versa.

The Prize Committee shall receive all papers which have been sent to the state secretary, whether approved for publication or not, on or before January 1. The sealed written report of the Prize Committee shall be submitted to the state office before March 1.

The Executive Committee, at the first meeting after March 1 of a given year, shall open the nom de plume envelopes and furnish the secretary the proper names of the authors for the published annual program.

The Council shall consider the report of the Prize Committee at its first meeting of the annual session, and shall announce the result at the first general meeting of the Association.

COMPONENT COUNTY SOCIETIES

CONTRA COSTA COUNTY

Dr. M. L. Fernandez was host to the Contra Costa County Medical Society, Saturday, May 28, 1927, at his beautiful home in Pinole.

The meeting was purely a business one, having as its object to revise the constitution and by-laws of the society, and to organize welfare work to be done by the society.

Dr. L. A. Hedges was made a member of the society.

Doctors Rowell, Beard, and Bumgarner were appointed as a committee to revise the constitution and by-laws.

A most delightful supper was served by Mrs. M. L. Fernandez, following the adjournment of the meeting.

S. N. Weil, *Secretary.*

KERN COUNTY

The regular meeting of the Kern County Medical Society was held at the Kern General Hospital, May 19, at 8:30 p. m. The meeting was called to order by the past president, Doctor Compton.

Doctor Jones, secretary, read the correspondence. A letter from the San Diego Medical Society, relative to health work, was read, discussed, and a motion moved, seconded, and carried that the city and county health officers and Doctor McNamara investigate the matter and act accordingly. Dr. Joe Smith was appointed chairman of the committee.

Dr. W. D. Sansum, Cottage Hospital, Santa Barbara, was introduced. He gave an exceedingly interesting lecture on "Diet and Insulin." Thanks were extended to Doctor Sansum.

The meeting adjourned to the lunch room, where light refreshments were enjoyed. The meetings will be discontinued until next September 15.

Robert M. Jones, *Secretary.*

ORANGE COUNTY

At the regular meeting of the Orange County Medical Society the following resolutions and memorial were adopted:

Whereas, A member of the Orange County Medical Association, David William Hasson, died at his home in Buena Park on March 31; and

Whereas, Doctor Hasson was one of our oldest members, and was respected and loved by all, therefore be it

Resolved, That we sincerely regret the death of our beloved associate, and that the sympathy of this Association be extended to his bereaved wife and family; and be it further

Resolved, That a memorial of his life work be prepared, and that copies of this memorial and these resolutions be sent to the bereaved family and be placed in the records of this Association.

A local Public Welfare Committee consisting of Drs. John Wehrly (chairman), Bessica Raiche, and G. V. Presson has been appointed to cooperate with the corresponding state committee.

R. D. Ball, *Secretary.*

SACRAMENTO COUNTY

The May meeting of the Sacramento Society for Medical Improvement was held in the Empire Room of the Sacramento Hotel on the evening of the 17th. There were thirty-seven members in attendance. The minutes of the April meeting were read and approved. There were no case reports.

Edward W. Beach presented a most interesting discussion of "Some Common Kidney Lesions." Some of the commoner lesions of the kidney, which, of necessity, embraced those of the upper urinary tract, were considered, briefly discussed and demonstrative slides shown of types. Lantern slides were prepared from plain x-rays and pyelograms.

The group comprised (1) stones, (2) hydronephrosis,

(3) ureteral strictures and kinds, (4) tuberculosis, (5) tumors of the kidney.

A resumé of the history of pyelography was given, and the picture of a typical pelvis, distended with an opaque media shown. Deviations were mentioned.

Under discussion of stones, considerable time was devoted to the etiology. Beach pointed out the ability of certain colloidal bodies, always existent in the urine, to exert a "protective action" upon the more insoluble crystalloids as calcium oxalate and uric acid, and to hold these in "colloidal suspension." Surface tension, alteration in the presence of infection and stasis was also a factor in certain cases. Various animal experiments in the actual production of stones were reviewed. A great field of theoretical therapeutics as applicable to the reversible solvency of the colloidal matrix of stones is opened by these experiments. Stones were divided for demonstrative purposes into (1) solitary types, (2) staghorn calculi (3) uric acid showers.

Under hydronephrosis, examples of bilateral types were shown, due to mechanical impediment at the bladder level. Several types of obstructions, unilateral, intermittent in character above the bladder level, were discussed with the consequent degrees of hydronphrosis leading to total kidney destruction shown.

Under strictures, Hunner's work was discussed. Several unusual cases of ureteral strictures and kinks were demonstrated with the resultant kidney pathology.

Under tuberculosis, several interesting cases of calcific deposition with its characteristic soft, feathery, waxy outline were presented in the plain x-ray, notably one in a boy 5 years of age. Various degrees of destruction by the Koch's bacillus from a single excavation of a calyx to autonephrectomy were thrown on the screen.

Under tumors, the cysts were excluded. Several hypernephromas were shown including an unusual case in a young man of 30 years who recently died under the writer's care. Characteristic displacement of the kidney and ureter by extra renal tumors was emphasized and illustrated on the screen.

The paper was discussed by Jones, Hale, Wilder, and Harris.

The second reading of the application for membership of Thomas R. Haig was followed by a vote. He was unanimously elected. A like application from Clarendon A. Foster resulted in the rejection of the application.

The Board of Directors reported that the Public Relations Committee had received the communication from Martha Welpton, chairman of the State Welfare Committee. The recommendations of the latter communication will be studied so as to fit in with their local program.

Jones, local delegate to the state convention; Thomas, secretary; and Harris, councilor, gave their respective reports of the 1927 meeting at Los Angeles. The scientific meetings were briefly reviewed. Certain phases of the proposed state constitution were outlined, and all brought word of the importance of our immediate organization for the 1928 meeting.

A communication was received from the state secretary and was accompanied by a new charter for the society.

Our proposed amendments to the local constitution are in the hands of Hartley Peart for legal opinion. These were presented to Mr. Peart on April 29. A communication from him, dated May 5, tells us that we will hear from him shortly. It is hoped that we may take final action on these at our June meeting.

Meeting adjourned to a buffet lunch.

BERT S. THOMAS, *Secretary.*

SAN DIEGO COUNTY

At the May dinner meeting of the medical society held at Seltzer's Café, Dr. Clarence Rees read an excellent paper on the treatment of certain types of cancer with the low heat cautery, setting forth the advantages in technique, in safety, and in results of this form of treatment. His paper was discussed by Doctors Newman, Burger, Lee, Harding, Marlowe, Lounsberry, Hoover, Markley, and Rees.

The May meeting of the Mercy Hospital staff was given over largely to a discussion of an epidemic of measles which has been rampant in the city, and especially of the middle ear and mastoid complications which have occurred in a high percentage of cases. Open discussion of the subject was started by Charles W. Brown and participated in by Wessels, Higbee, Burton, and others.

The Medical Library directors, empowered by an overwhelming vote of its membership, are planning to move the library into the new and spacious quarters offered them by the management of the new Medico-Dental Building. These rooms are on the fourteenth floor and command a magnificent view of bay, ocean, and mountains, an ideal retreat for quiet study.

ROBERT POLLOCK.

SAN JOAQUIN COUNTY

The stated meeting of the San Joaquin County Medical Society was held at headquarters of the local Health District, 129 South American Street, Thursday evening, June 2, 1927. Vice-President George H. Sanderson called the meeting to order at 8:30 p. m. Twenty-five were in attendance. Those present were: Drs. E. A. Arthur, N. P. Barbour, E. L. Blackmun, J. F. Blinn, C. A. Broddus, Fred P. Clark, Fred J. Conzelmann, C. F. English, L. M. Haight, C. D. Hollinger, J. P. Hull, H. E. Kaplan, S. E. Latta, R. T. McGurk, F. G. Maggs, F. J. O'Donnell, S. F. Priestly, G. H. Rohrbacher, G. H. Sanderson, J. J. Sippy, F. B. Sheldon, Margaret H. Smyth, C. V. Thompson, A. L. Van Meter, and Dr. Harry Spiro, guest and speaker of the evening. Doctor Thompson of San Francisco and Doctor Hurt of Oakdale were present as visitors. The minutes of the previous meeting were read and approved. The president introduced Doctor Spiro, who spoke on "Diagnosis of Conditions of the Heart and Aorta." Doctor Spiro spoke mostly of his experience in heart and aortic conditions and his great interest in radiology as a means of diagnosis, and brought out of his treasury things old and new. He tried to show that all methods of determining heart size by x-ray are subject to a great percentage of error, so much so that he had practically discarded the various methods of determining heart surface area and heart diameters on films taken in the so-called frontal position only. He stated that his experience, based upon over one thousand cases, had shown him that the determination of the anteriorposterior diameter of the heart, using an "angle finder" of his own invention for determining this anteriorposterior diameter, had given him more accurate results than any previous method of determining heart size with which he was acquainted.

In order to make a diagnosis, or a differential diagnosis between a functional heart murmur and an organic heart murmur, heart size was one of the determining factors. If one could determine that there was an increase in heart size and a murmur present there probably was no organic defect present. But, Doctor Spiro stated, most teachers today advise that even if the heart is increased in size the finding of systolic murmurs in the region of the apex may mean nothing. This has led to rather a confusing state of affairs. In order to avoid confusion, and in order that the physician may be positive or nearly so, of his diagnosis, Doctor Spiro claimed that if one can determine that the left auricle is enlarged that then the systolic murmurs heard in the region of the apex must be due to the mitral valve defect, and the doctor showed that the best position in which to determine this increase in left auricular size is in the so-called left anterior oblique position.

If the patient is fluoroscoped in this position at an angle of 45 degrees or more, one can be almost sure as to whether there is a left auricular enlargement or not. He stated that if he does find left auricular enlargement that there is a mitral valve defect present, and if there is no left auricular enlargement that there is no mitral valve defect present. He made the statement more emphatic by saying that the above criterion holds irrespec-

tive of the nature of the sounds heard during the course of physical examination.

The determination of the size of the left auricle is helpful also in differentiating between mitral and aortic valve defects. He also showed that, by examining the patient in the left anterior oblique position, it is possible to measure to some degree of accuracy the descending aorta, and he showed that frequently patients have a diagnosis of aneurysm of the arch of the aorta attached to them when, as a matter of fact, it is only a slightly elongated arch of the aorta.

He also showed that the right anterior oblique position is the best position in which to accurately measure the ascending aorta and stated that frequently patients with symptoms of angina pectoris may have an enlargement of either ascending or descending aorta, and yet by ordinary pictures in the frontal plane no pathology is demonstrated.

Doctor Spiro also makes what is called a cardiac pattern. During the fluoroscopic examination he outlines the patient's heart upon the chest, and from this outline he makes a celluloid pattern which is afterward used to check physical findings, thus sometimes avoiding the necessity of a re-examination by x-ray.

He illustrated his talk with lantern slides and motion pictures. A general discussion followed, and the members asked many questions which Doctor Spiro answered in an instructive manner.

There being no further business the meeting adjourned *sine die*.

FRED J. CONZELMANN, *Secretary*.

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STANISLAUS COUNTY

On May 13 the regular meeting of the Stanislaus County Medical Society was held at the Hotel Hughson. Following the dinner, Dr. E. Bancroft Towne of San Francisco talked on neurosurgery.

He gave some highly practical impressions of injuries to the brain, spinal cord and peripheral nerves. This was one of the best and most practical talks ever given the society. Doctor Towne paid special attention to spinal drainage in head injuries. He also called attention to the frequent bad end-results of fractures of the extremities because of overlooking nerve injuries.

There were twenty-two members present. Dr. and Mrs. A. L. Van Meter of Stockton were present.

The secretary was instructed to write to the Modesto *Evening News* endorsing the health articles by Dr. Morris Fishbein.

The medical society is passing through the most successful year of its history. The meetings are very well attended.

J. W. MORGAN, *Secretary*.

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SANTA BARBARA COUNTY

The regular monthly meeting of the Santa Barbara County Medical Society was held on Monday evening, June 13, at 8 o'clock in the Cottage Hospital, with President H. E. Henderson in the chair.

There were present thirty-six members of the society, and several visitors.

The following papers were given:

"The Theory of Cancer"—M. Thorner, M. D., Santa Maria.

"Colloidal Lead and Radiation in the Treatment of Cancer."—H. J. Ullmann, M. D.

"Effect of Lead on Normal and Malignant Tissue"—Doctors Evans, Nuzum, and Ullmann.

"Ureteral Stone Extraction"—Irving Wills, M. D.

The first three papers were discussed by Doctors Brown, Nuzum, Geyman, Means, and Ullmann.

The fourth paper was discussed by Doctor Pierce.

The meeting then went into executive session, and the transfer card of Dr. Bard S. Berry from the San Francisco County Medical Society was read. It was moved, seconded and carried that Doctor Berry be admitted into the Santa Barbara County Medical Society.

The application of Dr. R. F. Atsatt for membership in the society was read and, having been approved by the Board of Censors, upon ballot Doctor Atsatt was unanimously elected a member of the society.

There being no further business the meeting adjourned.

WILLIAM H. EATON, *Secretary*.

CHANGES IN MEMBERSHIP

New Members—Butte County—John H. Alexander, Chico.

Contra Costa County—L. A. Hedges, Richmond.

Fresno County—Elmer J. Schmidt, LaRue Moore, Fresno.

Los Angeles County—Joseph A. Ball, Chris R. Halloran, Benjamin Hoyt, Paul K. Ito, Ralph Lommen, Margaret R. Otis, Lydia Ovchinnikoff, E. A. Royston, Rolla C. Purdy, Solomon Reina, Herbert Sugar, Benjamin C. Tarnutzer, M. H. Topping, Los Angeles; Carl L. Ballard, Joel S. Kelsey, Santa Monica; R. G. Henderson, Robert S. Magee, Frank E. Stanton, Long Beach; Port R. McWhorter, Beverly Hills; S. P. Tipton, Glendale.

Orange County—Frederick O. Kaps, Frederick S. Pope, Santa Ana.

Sacramento County—Thomas R. Haig, Sacramento.

San Francisco County—Joseph William Crawford, Vincent V. Hardeman, Robert H. MacLauchlan, Frederick P. Shafer, H. Gordon Smith, Frank Elwood Stiles, Samuel L. Welfield, San Francisco.

San Joaquin County—Percy B. Gallegos, Stockton.

Transferred Members—Bard S. Berry, from San Francisco County to Santa Barbara County.

Claude H. Church, from Merced County to Alameda County.

Stella R. Lehr Zimmerer, from Alameda County to Riverside County.

Resigned—Morgan Walcott, San Diego County.

DEATHS

Cothran, William F. Died at Santa Cruz, May 18, 1927, age 59 years. Graduate Medical Department University of California, 1905. Doctor Cothran was a member of the Santa Cruz County Medical Society, the California Medical Association, and Fellow of the American Medical Association.

De Chantreau, Jacques D. Died at San Francisco, June 10, 1927, age 60 years. Graduate Faculty of Medicine, Paris, France, 1891. Licensed in California, 1892. Doctor De Chantreau was a member of the San Francisco County Medical Society, the California Medical Association, and Fellow of the American Medical Association.

Fossum, Otto B. Died at San Luis Obispo, May 27, 1927, age 54 years. Graduate of College of Physicians and Surgeons, San Francisco, 1909. Doctor Fossum was a member of the San Luis Obispo County Medical Society, the California Medical Association, and Fellow of the American Medical Association.

Goodwin, Joshua S. Died at Los Angeles, May 27, 1927, age 31 years. Graduate of the Rush Medical College, 1922. Licensed in California same year. Doctor Goodwin was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

Merrill, Benjamin Eugene. Died at Santa Paula, June 10, 1927, age 56 years. Graduate of Hahnemann Medical College, Philadelphia, 1901; Medico-Chirur. College, Pennsylvania, 1904. Licensed in California in 1911. Doctor Merrill was a member of the Ventura County Medical Society, the California Medical Association, and Fellow of the American Medical Association.

Shaw, Joseph Hughes. Died at Santa Rosa, May 23, 1927, age 45 years. Graduate of University of Cincinnati, Ohio, 1908. Licensed in California in 1914. Doctor Shaw

was a member of the Sonoma County Medical Society, the California Medical Association, and Fellow of the American Medical Association.

Stephenson, Andrew Victor. Died at Long Beach, March 24, 1927, age 57 years. Graduate of the Omaha Medical College, Nebraska, 1896. Licensed in California in 1916. Doctor Stephenson was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

Obituary

Hasson, David William. Born February 20, 1847, in Jo Davies County, Illinois, where he was educated in the public schools.

He enlisted in the Union Army in 1863 when less than 17 years of age and served to the end of the war in 1865 in Company F, 92nd Illinois Mounted Infantry, being mustered out as a sergeant. He settled in Elk Point, South Dakota, where he served as county clerk and recorder for some years.

In 1877 Doctor Hasson graduated from the State University of Iowa College of Medicine, and began a general practice in Vermilion, South Dakota, and Pancra, Nebraska, until he served as assistant superintendent of the Norfolk Hospital for the insane, 1888-93. His California certificate was issued in 1893. He practiced in Mentone, San Bernardino County, and Downey until 1898, when he came to Buena Park, where he remained until his death. He was admitted to the Orange County Medical Society in 1901 and served as president in 1914, and was also a member of the California Medical Association and a Fellow of the American Medical Association.

Doctor Hasson was also active in the life of the community. He served one term during 1900-01 as Assemblyman in the California Legislature, where he was the author of the Medical Practice Act of 1901. He was a member and past commander of his local G. A. R. post, and also a past commander of the Southern California Veterans' Association. He was an active Mason and a charter member of his local lodge.

He is survived by his widow and three sons.

Doctor Hasson was one of our oldest and most beloved members. During his active life he was a regular attendant at meetings, and contributed much to their success with his ideas and his cheerfulness. We shall indeed miss his presence.

UTAH STATE MEDICAL ASSOCIATION

W. R. CALDERWOOD, Salt Lake.....President
E. H. SMITH, Ogden.....President-Elect
FRANK B. STEELE, Salt Lake.....Secretary
J. U. GIESY, 701 Medical Arts Building, Salt Lake.....
.....Associate Editor for Utah

SCOTCHING A SNAKE

We remember when diphtheria was a scourge in the community—one of the greatest causes of infantile mortality—a menace to be dreaded, at the diagnosis of which the parent of one afflicted by it turned pale and well-nigh ceased to hope. We remember the advent of antitoxin, and the furore pro and con which it aroused. We remember being placed in a position where one almost needed a gun to enforce its administration because of prejudice. And now we hail the work of Schick and the advent of toxin-antitoxin as still another weapon in scotching this dread menace.

Recently in Utah County an intensive campaign of immunization has been carried out under the supervision of the local Health Unit and the State Board of Health. Begun in 1926 the work has gone steadily forward until now it has achieved a very gratifying result. Elsewhere in this section it is mentioned in more statistical fashion. But here we desire merely to congratulate the Utah County officials on the success of their work. Prevention has always been considered far the better method, where prevention could be brought about. If then the incidence of this disease can be cut to a minimum, certainly a splendid result has been achieved. Furthermore the effects are still more far reaching yet. Such work when consistently carried forward cannot fail to give to the laity a better conception of the profession and its ceaseless endeavor to cooperate with the laity toward better and better standards of health. To such work any conscientious physician may well subscribe his approval or grant his aid. It is in such ways that the profession may best advertise.

The task confronting the profession today is through a campaign of education to scotch the snake of misunderstanding and ignorance. As education has always been the cure of ignorance of whatever nature, we feel that through a broader public education we shall find our main assistance. Let us not only scotch the snakes of ignorance—but kill them.

X-RAISE

Paraphrasing slightly an old quotation: We rise to remark, and our meaning is plain, that for ways that are dark and for tricks that are vain, this Fleischman's Yeast is peculiar.

On our desk lies this invitation to a "Grocers' Party":

> "Enclosed you will find two admission tickets to the party which is being given to Salt Lake Grocers by the Fleischman Company on Thursday, June 9, at 8:30 p. m. in the new Elks Club, Salt Lake City.
>
> "At that time we are showing our three-reel movie 'Youth Regained,' which consists of x-ray pictures of the Human Stomach and Intestines, of which we telephoned you.
>
> "We are looking forward to seeing you."

The tickets then contain a dotted line on which the attending doctor is to sign his name—as proof of his presence of course.

How many of the local fraternity of medicos "rose" to the occasion we do not know. We have heard of none or talked with none as yet. Apparently their interest in the human stomach and intestines was not great enough to induce their attendance, although refreshments and dancing followed the pictures.

There is something almost pathetically amusing in the evaluation of medical mentality by this casual suggestion that physicians come to the party and sign their names.

Fundamentally, I feel that yeast is a good thing. It has revolutionized the baking industry since the days when our ancestors pounded grains on a rock and baked the resultant powder mixed with milk or water on a stone. Indirectly yeast is a splendid thing for the advertising department of many a magazine. There it has "raised" the monthly income to a considerable degree. I must presuppose that for its makers yeast must be "raising the wind," since they can pay for the advertisements and give "par-

ties" and still pay dividends. But at the same time and in all fairness, this latest publicity stunt will do little more than "raise" a laugh when applied to medical men. While written in a somewhat facetious fashion, back of the entire episode there is a serious attempt to gain the seal of approval from the profession by inducing a number of physicians to attend such a function and sign their names as having gone to see an x-ray film of the peristalsis of the colon, supposedly speeded up by this yeast, which it is alleged can even raise the unstripped fiber from a sluggish to an active state. And it is to that we object—to even the veiled suggestion that graduate physicians should deem it needful to go and watch the haustrations—to haustrate at a "Grocers' Party."

Utah County Puts Stop to Diphtheria—Completion of an intensive campaign of diphtheria immunization among children of school and preschool ages was announced in a report received Tuesday from the Utah County health unit.

The Utah County unit was organized through the State Board of Health and the International Health Board, and placed in charge of Dr. Lloyd L. Cullimore and Mrs. E. Reed, public health nurse.

In 1926 some work was done toward immunizing children against diphtheria, and this spring the campaigns were again resumed with the objective of inoculating all children possible.

The campaign has extended to include 43,536 inoculations given to a total of 13,512 people, according to Doctor Cullimore. Of these 4572 are residents in the Nebo district, 4140 in the Provo school district, and 4800 in the Alpine district. In the grade schools 93 per cent of the children were immunized. In the junior high 89 per cent, while in the senior high schools this dropped to 57 per cent. In the B. Y. U. 51 per cent of the high school students were reached, 95 per cent of the junior high school students were treated, with other treatments to 96 per cent of those in the training school and 12 per cent of the college students. It is estimated that but 18 per cent of the preschool children were immunized.

Epidemics of contagious diseases made it impossible for many to avail themselves of the opportunity, said Doctor Cullimore. Many did not realize the importance of protecting the preschool child and, with these two conditions prevailing, many preschool children were not reached. Not a single case was reported out of the 43,536 inoculations in which any bad result was noted, Doctor Cullimore asserted.

Medical news is at a standstill. Of course some of the men are going a-vacationing, some are going to conventions, some are going to Europe. All the component societies have held their last meeting for the spring and adjourned till fall. Next month we will print the proceedings of the State Association meet in full. Watch for that. We are going to have a wonderful program.

Minutes of the Salt Lake County Medical Society, Salt Lake City—The regular meeting of the Salt Lake County Medical Society was held in the assembly room of the Medical Arts Building, Monday, May 23, 1927.

Meeting called to order at 8:15 p. m. by Vice-President William H. Beer. Thirty-seven members and three visitors were present.

Minutes of the previous meeting were read and accepted without correction.

The society was extremely fortunate in having J. Marion Read of San Francisco, assistant clinical professor of medicine at Stanford University, as the speaker of the evening. He read a very interesting paper on "Clinical Interpretation of the Pulse Pressure" based on observations made of a thousand cases of thyrotoxicosis. He pointed out that the pulse pressure increased along with the increase in metabolic rate. He also talked about the increased pulse pressure in patients with heart block.

This paper was discussed by C. Fred Wilcox and L. E. Viko.

Application for membership signed by P. V. Jamison was read.

Adjournment at 9:15 p. m.

M. M. CRITCHLOW, *Secretary.*

International Cancer Control Symposium Proceedings Ready for Distribution—A complete account of the proceedings of the International Symposium on Cancer Control, held at Lake Mohonk, September 20-24, 1926, will be ready for distribution the early part of June. This volume of some 360 pages will contain all the papers read at the symposium together with an account of the discussion. The following partial list of titles and authors indicates the scope of the volume:

The Value of Co-ordinated Effort Among Surgeons, Pathologists and Others in the Control of Cancer—Sir John Bland-Sutton, Bt., Vice-Chairman of the British Empire Cancer Campaign; President of the Royal College of Surgeons.

Cancer Education in England—Dr. W. Sampson Handley, F. R. C. S., Professor of Surgery and Pathology in the Royal College of Surgeons of England; Surgeon to the Middlesex Hospital, London.

The Organized Movement Against Cancer in France—Prof. Henri Hartmann, Director of the Anticancer Center of Paris; Professor of Surgery at the University of Paris.

The Organization and Practical Working of the Centers Against Cancer in France—Prof. Léon Bérard, Director of Anticancer Center at Lyons; Professor of Surgery at the University of Lyons.

The Need of Special Institutions for the Investigation and Treatment of Cancer as Compared with Other Methods of Dealing with Cancer Patients—Prof. T. Marie, Professor at the Faculty of Medicine and Pharmacy of Toulouse; Director of the Regional Anticancer Center of Toulouse.

The Campaign Against Cancer in Switzerland—Dr. Charles Dubois, President of the National Swiss League Against Cancer; Professor of Dermatology, University of Geneva.

Morbidity Statistics at the Anticancer Center of Geneva—Dr. Albert Reverdin, General Secretary and Treasurer of the Anticancer Center of Geneva; Member of Swiss Anticancer League.

The Anticancer Campaign in Belgium—Prof. J. Maisin, Professor at the University of Louvain; Director of the Cancer Institute of the University of Louvain.

Cancer in Denmark—Prof. Johannes Fibiger, Professor of Pathological Anatomy in the Faculty of Medicine at Copenhagen; President of the Committee of the Danish General Medical Association for Cancer Research.

The Movement in Italy for the Control of Cancer—Prof. Raffaele Bastianelli, Vice-President of the Italian League for the Control of Cancer; Associate Professor of Surgery, University of Rome.

The Organized Movement for the Control of Cancer in America—Dr. George A. Soper, Managing Director of the American Society for the Control of Cancer, New York.

The Evidence of the Value of Education in the Control of Cancer—Dr. Joseph Colt Bloodgood, Associate Professor of Surgery at Johns Hopkins Hospital, Baltimore.

The Prevention of Cancer—Dr. James Ewing, Professor of Pathology, Cornell University Medical School; Director of the Memorial Hospital, New York.

How We Should Regard the New Theories of the Origin of Cancer—Prof. Gustave Roussy, Professor at the Faculty of Medicine, University of Paris; Director of the Institute for Research and Treatment of Cancer at Villejuif for Suburban Paris.

The Tissue and Racial Specificities of Cancer—Dr. James A. Murray, F. R. S., Director of the Imperial Cancer Research Fund, London.

The Clinical Value of Certain Phases of Cancer Research—Dr. Francis Carter Wood, Professor of Clinical Pathology and Director of Institute for Cancer Research, Columbia University, New York.

MISCELLANY

COMMENT ON CURRENT ARTICLES

From time to time articles and items are printed in this journal which would seem worthy of special comment or, at least, to which the attention of readers might be called. That thought is what inspires the inauguration of this column, which, as occasion indicates, will make its appearance in this department of California and Western Medicine.

Hubert Work's Address—The California Medical Association was honored when Hubert Work, M. D., Secretary of the Department of the Interior and member of the Cabinet of President Coolidge, disarranged his itinerary so that he might be present and make an address at the fifty-sixth annual session of the California Medical Association.

His paper was printed in the June number of CALIFORNIA AND WESTERN MEDICINE, and those members who did not hear him or who have not yet read his address in its printed form, should make a memorandum that this is one of the things that they intend to do.

It was an illuminating exposition which Doctor Work gave of the manifold medical and public health activities which have gradually grown up in this Department of the Interior of our government; which department the great majority of citizens are prone to visualize as having to do with almost all things concerned with the internal development of our country other than those directly concerned with the practice of medicine or the protection of the public health.

To medical men it is a gratification to know that the chief of the United States Department of the Interior is a physician, an ex-president of the American Medical Association, and an ex-chairman of its House of Delegates; and a medical man who for many years was one of the stalwarts in organized medicine in America, and whose influence in the development of the American Medical Association to the place it now holds, was most valuable and efficient.

The medical profession of America can take pride in the record which Dr. Hubert Work is making for himself in his services to our country. It is to be regretted that there are not a much larger number of men of his type from among the members of our profession who are willing to accept civic responsibilities and show their capacity to perform capable service for the people. In European and South American countries, medical men seem to exercise a much larger influence in civic affairs than in the United States. All service which medical men render in these civic positions increases the respect which lay citizens hold concerning the efficiency and standards of medical education and of the healing profession.

We are glad that so outstanding an exponent of the high type of modern physician and surgeon has been selected in the person of Dr. Hubert Work for the important public duties which he is called upon to fulfill. We are also very happy to have the pleasure of having had him with us at our recent annual meeting; and appreciate his courtesy in making a special effort to be at Los Angeles on that occasion.

A Message from the Old South—It was good to get some of the atmosphere of the Old South in the person of Dr. Stuart McGuire of Richmond, Virginia, who was one of the guest speakers at the fifty-sixth annual session of the California Medical Association. The polished address which he delivered was replete with substance, and provocative of serious thought by all who hold dear the highest interests of the healing art. What more fair method of approaching matters of discussion than through "a credit and a debit" column, as he did in his address, which was also printed in our June issue?

Doctor McGuire's pen picture of the status of medical education in America, the serious problems confronting recent graduates and also the communities which are or should be served by such graduates, was an excellent summary of those much-discussed questions. The remarks on the development of modern specialists, and of group clinics, were much to the point. The advantages and weaknesses of laboratory methods in diagnosis were pointed out; similarly his comments on the modern hospital, and particularly the danger of small hospitals not properly manned. The value of medical societies, the good that accrues from attendance at their meetings, the stimulating results of attendance at clinics of colleagues, the bigness of public health work in general, and of the United States Public Health Service in particular, were other topics which were given illuminating consideration. Doctor McGuire's paper is worthy of perusal not once, but several times, by all who would orientate themselves thoroughly on some of the major problems having to do with modern medicine, because these subjects are constantly coming up in our medical societies for consideration. Knowledge of actual facts will make for logical and effective action, when we are called upon to vote upon these matters.

C. M. A. Prize Essay of 1927—Several years ago the Council of the California Medical Association seriously discussed the desirability of awarding one or more research prizes to members of the profession of our state. It was hoped by such means to especially stimulate the younger members to carry on research studies, the results of which could be presented at the annual meetings. At the same time it was decided to give a nominal reward to the successful contestants as an expression of the appreciation of our Association.

The Committee on research prizes, when it reported this year to the Council, stated that its members felt that more publicity should be given to the fact that the California Medical Association offered such prizes, in the hope of securing a larger participation. The prizes are again offered for 1928. The secretary of the Association will be glad to give information thereon to all who write for same. By complying with conditions found on page 92 of this issue, members may enter a paper in the prize competition and submit the same article for place on a section program of the annual session.

At the fifty-sixth annual session the committee's recommendation to the Council that one of the research prizes be given to Dr. Emil Bogen of Los Angeles for his paper on "The Diagnosis of Drunkenness," was adopted. This paper was printed in the June issue of CALIFORNIA AND WESTERN MEDICINE.

The subject itself could be affirmed to be one of universal interest in this land where the Volstead Act obtains and gives so much trouble to the Government and to both its law-abiding and nonlaw-abiding citizens.

We take it that the research award was not based so much on the second paragraph of Doctor Bogen's paper, in which there is a somewhat classic ensemble of the symptoms resulting from overgreat ingestion of alcohol, as for and upon laboratory procedures that had been elaborated.

After the award had been granted, it was learned that the research was based largely upon "data secured by careful clinical examination of the first one hundred persons suspected of alcoholism who were brought to the Cincinnati General Hospital during the latter half of the

year 1926." It should be noted that the paper did not state whether or not the clinical symptoms and signs were different in that region of the country, nor whether the number of citizens in that suspected condition who went to the county hospitals in that section was greater than in other parts of the United States.

The methods of examination which were presented are a valuable summary of special procedure, old and new, which can be followed by those colleagues who by circumstances or other affiliation with law-enforcing agencies, have occasion to be called upon to make diagnoses in matters of this kind.

It seems a curious state of affairs, however, that in the days when our land is under the sway of a national prohibition law that special methods of research for the detection of acute alcoholic intoxication should be necessary; and that in the California Medical Association, one of the large state medical societies of America, the colleague who made a research on this question should have performed a service and produced a scientific work which very justly entitled him to the annual research prize in the year 1927.

Associated Fees of Physicians and Surgeons—"Associated Fees—Medical and Surgical" when properly presented and understood by patients should be, and are, from the standpoint of the ethical code of physician, quite proper. "Fee splittings," on the other hand, very justly are not.

The chairman of the section on general surgery at the recent annual meeting, Dr. Fred R. Fairchild of Woodland, showed real courage in taking what is in many ways so unpleasant a subject as the above topic for his opening address to the surgical section.

He was quite right in his contention that medical men, be they internists or surgeons, should each receive from their patients compensation in proper relative portion for the work actually done by each. The unfortunate mental attitude which many patients have on the subject of what constitutes a fair fee for an internist, and a fair fee for a surgeon, depends in good part, as Doctor Fairchild affirms, upon the fact that so many of the laity are willing to pay properly or generously only if the service rendered has been of a presumably spectacular nature, and of a kind that is mystifying to them. Perhaps the medical profession, and especially our surgical colleagues, are both in part to blame for this overemphasis which the laity so often place upon the value of services rendered by the knife in the operating room; as contrasted with their sense of appreciation for service rendered when the same is performed quietly in the laboratory or at the bedside, with all dramatic features lacking.

There is much merit in Doctor Fairchild's contention "that in all cases where an internist and a surgeon have cooperated, their fees should be associated; that is, that one statement should be rendered, the bill being so itemized as to show definitely the obligation to each man."

This subject is one that has a very intimate association with medical economics, because in the last analysis it has to do with the bread and butter equation of the great majority of physicians and surgeons. There can be no question but that evils have grown in this matter; and there are some customs and traditions in regard to these fees which undoubtedly need readjustment. That readjustment is certain to come in time, but it will come to us at an earlier day, and in a more happy manner, if the whole subject receives early and careful attention by the component county societies in our state. Serious thought on the points made by Doctor Fairchild will help in coming to the proper conclusions.

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* In the original article it was erroneously stated that statistics were compiled from cases brought to the Los Angeles General Hospital.

NEWS

Specialist in Pathology Needed at Veterans' Hospital—The United States Veterans' Bureau Hospital at Knoxville, Iowa, is in need of a specialist in pathology. Applications for the examination for this position are now being received by the United States Civil Service Commission under its general announcement for medical officers (examination announcement No. 43).

The entrance salary is $3800 a year. Advancement depends upon individual efficiency, increased usefulness, and the occurrence of vacancies in higher positions. The highest salary paid to senior medical officers is $6000 a year. The position of senior medical officer is seldom filled from a register of eligibles, but almost invariably by the promotion of medical officers already on duty.

Competitors will not be required to report for examination at any place, but will be rated on their education and training (30 per cent), and their experience (70 per cent).

Full information regarding requirements for entrance to the examination is given in examination announcement No. 43 which, together with application form 2600, may be obtained from the United States Civil Service Commission, Washington, D. C., the secretary of the United States Civil Service Board, Custom House, Boston, Mass., New York, N. Y., New Orleans, La., or St. Louis, Mo., or the secretary of the United States Civil Service Board, Post Office Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn., Seattle, Wash., San Francisco, Calif., or Denver, Colo.

New Community Hospital at Redlands—Redlands is again to be congratulated, and can congratulate herself. She has "come across" with the money needed to build the new community hospital, and has made the grade in the time set. True, not quite the full amount has been brought in yet, but out of the $225,000 cash sought, $190,000 has been subscribed, and the executive committee has guaranteed to get the rest. . . .

And *The Facts* pauses just long enough to remark that largely through the efforts of one man the thing was done, in its early and most important stages. He is Dr. Gayle G. Moseley. Most people who thought about it and talked about it suggested that the enterprise be postponed a year. Doctor Moseley laid the foundation for present success with several weeks of devoted work, interviewing prominent people. He had the stage set and the proposition ready to go.

Here's to everybody concerned, and especially to Doctor Moseley.—*The Daily Facts* (Redlands).

Reprints of Hippocratic Oath—William J. Kerr, M. D., has had reprints of 500 copies of the Hippocratic Oath made for presentation by him to senior students of the University of California Medical School, San Francisco.

The reprints are reproduced on Kelmscott hand-made paper by Frederic W. Goudy, printer and letter-designer, of Marlborough-on-Hudson, New York, following his study at first hand of the beautiful letter-forms evolved by the stone-cutters of ancient Rome. The translation is taken from that made of the Works of Hippocrates by Francis Adams, LL. D., Surgeon; first published in 1849 by the Sydenham Society, London, in two volumes, octavo.

Medical Progress a la Shuman—One of the most thorough and readable reviews of medical progress during the past few decades appeared in the *Medical Times* of January of this year. Interesting because of its clear perspective and philosophic outlook, and because it was written by one of the most capable men today in internal medicine—John William Shuman, M. D., F. A. C. P., of Los Angeles. The Missouri Valley Medical Society was a heavy loser when Doctor Shuman went to Syria to take the chair of medicine in a college there. Los Angeles was the gainer when the world traveler surrendered his post and returned to the land of his birth. The old Missouri Valley Society has had in its membership some of

America's most brilliant lights, and whether death or removal has separated them, they still live; Shuman is one of them.—J. M. Bell, *Med. Herald.*

Western Branch of American Urological Association—The western branch of the American Urological Association is holding its 1927 session at Seattle, Washington, July 6. Clinics will be held at St. Vincent's Hospital, Portland, July 5; at the Medical-Dental Building, Seattle, July 6, and at the Vancouver General Hospital, Vancouver, July 7. Speakers on the general program are: Bernard G. Scholefield, Boston; William H. von Lackum, Rochester; W. G. Shultz, Tucson; Miley B. Wesson, San Francisco; Elmer Hess, Erie; Henry A. R. Kreutzmann, San Francisco; Herbert A. Rosenkranz, Los Angeles; William E. Stevens, San Francisco; Joseph Walker, Los Angeles; Harold L. Morris, Detroit; Charles P. Mathé, San Francisco; Wilbur B. Parker, Los Angeles; and G. Shearman Peterkin, Seattle.

Otological Society Meeting—The American Otological Society at its sixtieth meeting had installed an Institutional Acousticon, and individual instruments were wired to the seats of those who ordinarily have much difficulty in attending public meetings and getting any enjoyment because of deafness.

The other unusual event of the meeting was a demonstration of the Osiso by lantern slides. The Osiso is a new instrument which converts sound waves into visible images which are easily read by those educated in its use. It has been successfully used in the Central Institute for the Deaf at St. Louis, Missouri.

Special Course for General Practitioners in Physical Therapy—The Stanford Medical School announces to the physicians in California that Frank B. Granger, M. D., of Boston, Massachusetts, will conduct a one-week course in physical therapy from September 26 to 30, 1927.

This course will afford the physicians an opportunity to obtain, under ethical conditions and without any commercial connections, the latest and most authoritative developments of this branch of the therapeutic art from a recognized expert in this medical field.

Doctor Granger was director of physical therapy in the United States Army during the World War. At the present time he is physician-in-chief of the Department of Physical Therapeutics at the Boston City Hospital. Besides being instructor in physical therapeutics at the Harvard Medical School, and lecturer on the same subject at the Tufts Medical School, he is consultant to a number of hospitals, including the Boston Floating Hospital. He is a member of the Medical Council of the United States Veterans' Bureau and the Council of Physical Therapy of the American Medical Association.

The course will consist of lectures, demonstrations, the illustrative use of apparatus, and such clinics as can be fitted into the program. Special attention will be given to electrotherapy and the theoretical and practical application of such modalities as the galvanic, sinusoidal, faradic, static current, medical and surgical diathermy and the use of the ultra-violet ray.

It is proposed to devote each morning from 10 on, and each afternoon from 2 o'clock on, to the work of this course. The lectures and demonstrations will be conducted in Lane Hall, Stanford Medical School Building.

The course will be strictly limited to properly qualified licensed physicians and surgeons. A nominal fee of $10 will be charged for this course. On payment of the fee physicians will receive a card of admission to the lecture room in which the course is conducted.

Registration for the full course will be received at the dean's office, Stanford Medical School, on or before noon, September 20. Requests for information or remittances to cover advance registration should be addressed to The Dean, Stanford Medical School, 2398 Sacramento Street, San Francisco. A check for advance registration should be accompanied by the physician's name and home address, the medical school from which he graduated, and the year of graduation.

The American Medical Association will hold its 1928 annual session at Minneapolis.

Sanitarium Adopts Group Insurance—The personnel of the Livermore Sanitarium are now enjoying the benefits of insurance under the group insurance plan, through negotiations just completed between the sanitarium management and the Travelers' Insurance Company of Hartford, Connecticut, through its representative, Thomas B. Smith.

The plan is cooperative in that the management provided a policy of $500 for each employee, and the latter had the privilege of taking an additional amount based upon his earnings for which additional policy the sanitarium contributed a portion of the cost.

The policy gives the employees the advantage of a very low insurance cost. Increases in the premium rates as the employee grows older are met by the sanitarium, thus the employee will pay the same rate no matter how long the policy remains in force.

An interesting feature of the group insurance plan is that all employees irrespective of age or physical condition are accepted by the insurance company without medical examination. In addition to the death benefit the policy covers permanent total disability, and an employee leaving the organization has the privilege of securing an individual policy also without medical examination.

The sanitarium management says: "This plan is not paternalism or charity, but rather it is the fulfillment of a sincere desire to assist our group of workers in a material way and add to some extent to their peace of mind and security for the future as a just reward for their loyalty. It is hoped that this group insurance will foster and increase the spirit of cooperation and mutual goodwill, so essential in the performance of our daily tasks."

Summer Courses for Graduates in Medicine—The summer courses of the University of California Medical School in San Francisco opened on June 6, 1927, and closed July 2, 1927.

Thirty-seven graduates in medicine enrolled—twenty-one from California, four from Idaho, three from Washington, three from Oregon, two from Utah, two from Arizona, one from New Mexico, and one from Nevada.

The courses offered included General Medicine, Surgery, the specialties, and laboratory subjects.

University of California Medical School Notes—The following appointments, promotions, and resignations will become effective July 7, 1927:

Dr. Samuel S. Maxwell, professor of physiology, retires on August 4, 1927, and is appointed emeritus professor of physiology. Doctor Maxwell received the degree of Bachelor of Science from Amity College in 1886, Master of Science from Amity College in 1888, and Doctor of Philosophy from the University of Chicago in 1896. He came to the University of California in 1905, and was instructor in physiology from 1905 to 1907, assistant professor from 1907 to 1910, associate professor from 1910 to 1922, and professor from 1922 until his retirement.

Dr. James M. D. Olmsted has been appointed professor of physiology, vice Doctor Maxwell. Doctor Olmsted is now associate professor of physiology at the University of Toronto. He received the degree of Bachelor of Arts from Middlebury College in 1907, Bachelor of Arts from Oxford in 1911, Master of Arts from Oxford in 1914, and Master of Arts from Harvard University in 1918, and Doctor of Philosophy from Harvard in 1920.

APPOINTMENTS

Dr. Ian Maclaren Thompson has been appointed associate professor of anatomy, effective July 1, 1927. Doctor Thompson is at present assistant professor of anatomy at McGill University. He received the degree of B. Sc. from the University of Edinburgh in 1919, and the degrees of M. B. and Ch. B. from the University of Edinburgh in 1920.

William B. Faulkner, M. D., instructor in surgery.

George C. Hensel, A. B., M. D., instructor in orthopedic surgery.

Harry M. Kanner, M. D., instructor in obstetrics and gynecology.

Raymund J. Millzner, A. B., M. A., M. D., instructor in surgery.

PROMOTIONS

William J. Kerr, from associate professor of medicine to professor of medicine.

Howard C. Naffziger, from associate clinical professor of surgery to clinical professor of surgery.

Edward S. Sundstrom, from assistant professor of biochemistry to associate professor of biochemistry.

Olga Bridgman, from associate clinical professor of abnormal psychology to associate professor of psychology and pediatrics.

Hans Lisser, from assistant clinical professor of medicine to associate clinical professor of medicine.

Richard W. Harvey, from assistant clinical professor of neurology to associate clinical professor of neurology.

Velav H. Podstata, from assistant clinical professor of psychiatry to associate clinical professor of psychiatry.

Edward W. Twitchell, from assistant clinical professor of neurology to associate clinical professor of neurology.

Hiram E. Miller, from assistant clinical professor of dermatology to associate clinical professor of dermatology.

Mary E. Botsford, from assistant clinical professor of anesthesia to associate clinical professor of anesthesia.

Howard E. Ruggles, from assistant clinical professor of roentgenology to associate clinical professor of roentgenology.

Irwin C. Schumacher, from instructor in medicine to assistant professor of medicine.

Alfred H. Washburn, from instructor in pediatrics to assistant professor of pediatrics.

Eva C. Reid, from instructor in psychiatry to assistant clinical professor of psychiatry.

Laurence Taussig, from instructor in dermatology to assistant clinical professor of dermatology.

Montague S. Woolf, from instructor in surgery to assistant clinical professor of surgery.

Herbert S. Thomson, from instructor in surgery to assistant clinical professor of surgery.

Mary Kavanagh, from instructor in anesthesia to assistant clinical professor of anesthesia.

A. J. Salle from assistant in bacteriology to instructor in bacteriology.

Stacy R. Mettier, from assistant in pathology to instructor in pathology.

Thomas H. McGavack, from assistant in homeopathic materia medica to instructor in homeopathic materia medica.

Ottiwell W. Jones, Jr., from assistant in surgery to instructor in surgery.

Stanley H. Mentzer, from assistant in surgery to instructor in surgery.

John C. W. Taylor, from assistant in otorhinolaryngology to instructor in otorhinolaryngology.

Ernst Wolff, from assistant in pediatrics to instructor in pediatrics.

RESIGNATIONS

Goodwin L. Foster, assistant professor of biochemistry.

Guy W. Clark, assistant professor of pharmacology.

Lovell Langstroth, assistant clinical professor of medicine.

Harry I. Weil, instructor in medicine.

History of Medical Practice in the State of Illinois—Doctors who lived formerly in Illinois, or who are descendants of pioneer physicians of the "Illinois country" will hear with interest that Volume 1 of the "History of Medical Practice in the State of Illinois" is ready for delivery.

The history has been written under the supervision of a committee appointed by the Illinois State Medical Society as a commemoration of its seventy-fifth anniversary, but more especially to make a living tribute to those valiant men of the medical profession who played so able a part in the exploration, settlement and development of the Illinois country.

In this first volume of the history are set down events from the earliest available knowledge of conditions in the Illinois country, along through the days of the Aborigines, and commencing with the actual records when, in 1673, Father Marquette had medical attention in Chicago, up until the year 1850.

In the second volume (now in preparation), narration continues up until the present time. Future years will bring other volumes, so that this history will be an ever virile monument to the men and incidents whom it would honor.

Research of years resulted in an opulent supply of material from which to compile this history, and has evidenced to an almost unbelievable degree the vital part played by physicians in every angle of the exploration, settlement and development of a country that is one of the richest and most influential sections of the richest country in the world.

It must be remembered that originally the Illinois country encompassed a territory far greater than the area now known as the states of Illinois, Wisconsin, Indiana, Missouri, Kentucky, and Iowa, as well as what is now Illinois, and even some sections of Ohio fell into that primitive epitome of the Illinois country. In the southern part of the state it was well into the nineteenth century before Missouri and Illinois ever acknowledged the natural divorce of interests made by the Mississippi River. Because of this, naturally enough, close interest in this history extends to physicians or to their descendants in practically every state in the Missouri valley or contiguous thereto.

Rare maps, unusual personal memorabilia and rare discretion in compilation, make this history of unique interest to doctors everywhere, and to many laymen.

This history of medical practice in the state of Illinois embodies, in the course of its narration, an interesting and illustrated digest of the early efforts of white settlers in Illinois, with specific allusion to the share in these tasks, performed by medical men. Included are portraits of rare interest, reproductions of historic documents, excerpts from diaries, personal letters, human reminiscences of days fraught with peril, filled with hope, and not devoid of humor, through a period of about 250 years. From the days of the "Chirugeon" who attended Pére Marquette, through the massacres at Fort Dearborn, the years of Indian raids, down with the circuit-riding "saddle-bag" doctors, to these days of radium and radio, this history marches. Attics, family albums, safe deposit vaults, and state records have been ransacked to produce the material needed for this chronicle. Illinois holds today the honor of being the world's medical center. Progressive steps of this achievement, and its contributive factors such as hospitals, asylums, sanitariums and allied institutions and medical college are set forth in detail, both pictorial, documentary and narrative. In brief, this account epitomizes the almost unequaled growth of a community whose economic wealth is paralleled by its public health. Personal data of the men, of the organizations, including pioneer army and navy physicians and surgeons and local, county and district societies, schools and hospitals as well as of the Illinois State Medical Society itself; various internationally famous medical discoveries made by Illinois men; the state's contribution to the world of research; medical libraries and periodicals existent in Illinois; campaigns for medical protection against enemies of public health; details of the various Medical Practice Acts; state sanitation from the notable drainage canal and the supervision of food supplies, vital statistics; meetings, officers, policies and finances of the state society; all this and more in accurate transcription make this history a miniature encyclopedia of scientific advance and desirable and hitherto unavailable information.

The edition is limited. It will not be reprinted. A place in every physician's library is merited by this volume, both as a tribute to the men who blazed the trail for modern scientific medicine and as an ever present reminder and authority as to what is happening to medicine right in this state every day, so far as finance, discovery, legislation and public relations are concerned, and the men who are responsible for the heritage of trust for over two centuries and a half. Volume 1 is now ready. Volume 2 will follow soon. Orders may be sent to Committee on Medical History, Illinois State Medical Society, Medical and Dental Arts Building, 185 North Wabash Avenue, Chicago, Illinois, Charles J. Whalen, M. D., Chairman.

Walter G. Campbell will Head Food, Drug and Insecticide Administration—W. G. Campbell, director of regulatory work of the United States Department of Agriculture, will administer the work under the Food, Drug and Insecticide Administration, which takes form

on July 1, 1927, according to an announcement by Secretary of Agriculture Jardine. Dr. P. B. Dunbar, now assistant chief of the Bureau of Chemistry, will be assistant chief of the new administrative unit. This unit, created by an act of Congress, is charged with the enforcement of the Federal Food and Drugs Act, the Tea Inspection Act, the Insecticide and Fungicide Act, the Naval Stores Act, the Import Milk Act and the Caustic Poison Act.

CALIFORNIA BOARD OF MEDICAL EXAMINERS

By C. B. PINKHAM, M. D., *Secretary*

According to the Fullerton *News Tribune* of May 9, 1927, Dr. J. E. Baker of Corona, armed with a loaded revolver, was arrested by local police, who claimed him to be a motor maniac. "When arraigned before Justice of the Peace Halsey I. Spence, Baker pleaded guilty to charges of reckless driving and carrying concealed weapons. He declared he had been arrested many times before for violating the speed laws. He was fined $200 and sentenced to twenty days in jail. . . . At police headquarters a large quantity of liquor was found in the medicine case. A box of cartridges and a loaded revolver were also found in the car. Baker was carrying a Los Angeles city physician's badge. The badge was declared bogus by the Los Angeles Police Department. . . ." It is reported that J. E. Baker, M. D., was recently sentenced to pay a fine of $100 or serve fifty days in jail for violation of the State Poison Law.

An alleged attack upon Sidney T. Brooks, Pasadena physician, at the point of a gun, was quietly disposed of today when Mrs. L. O. Moore began serving sixty days in jail after pleading guilty to a misdemeanor. . . . Circumstances surrounding the attack have been veiled with much mystery. Mrs. Moore is said to have refused to pay a $200 bill, demanding an appointment on a Pasadena street corner with the doctor. Anticipating trouble, the doctor was followed by two police officers. As the woman drew her gun the officers placed her under arrest. Moore was arrested a short distance away. . . .—*Los Angeles Record,* May 14, 1927.

Dr. Russell R. Burt, local surgeon, was acquitted yesterday by a jury in criminal court on a charge of having performed an illegal operation on a young woman. . . . —*San Diego Union,* April 22, 1927.

Further litigation over the death of Sally Lytton Howard of Pasadena, said to have been caused by application of an alleged poisonous face bleach, was promised today in a $50,000 damage suit brought against Fannie Briggs Carr, Inc., by Horace G. Lytton. . . . Mrs. Howard died at her home at 3124 Pasadena Avenue last October 26, five days after her face assertedly had become swollen and burned by the poison.—*Los Angeles Record,* April 22, 1927. (Previous entries January and February, 1927.)

Doctor Crowell, Indian herb doctor of Walkerton, appeared before Magistrate Creasor in the Police Court here, charged with illegal practice of medicine. . . .— *Los Angeles Examiner,* April 27, 1927. (Press dispatch Markdale.)

According to the report of our Investigation Department, on June 14, 1927, complaints were filed before Police Judge Rice at Modesto charging W. D. Cowan with practicing medicine without a license and also the obtaining of money by false pretenses, these complaints growing out of Cowan's connection with the so-called Folco Hospital Association. According to our reports, citizens in the vicinity of Modesto have been mulct out of some $50,000 in the sale of stock in the Folco Hospital Association, a Nevada corporation, upon the representation of Cowan that the corporation had on deposit with the Secretary of State of Nevada the sum of $250,000 cash to secure all future stock sales and which, according to our reports, is false. It is reported that Alfred Bach, mentioned in "News Items" of August and September, 1926, was recently in Modesto, alleged to be connected with either Cowan or the Folco Hospital Association; that both Cowan and Folcey have a record in the Criminal Identification Bureau. Up until late afternoon of June 14 local authorities at Modesto were unable to obtain service of the warrant upon Cowan, it being understood that he took his departure from Modesto shortly after the commencement of the investigation in question. It is also interesting to note that some $6000 was returned to three of the "investors" after our investigation was commenced.

"Dr." G. H. Curtis, arrested here several days ago by the Police on a charge of vagrancy, appeared before Judge Cecil S. Johnson in the Police Court and was given a thirty-day suspended sentence. He was ordered to leave the city on pain of having to serve the term. Investigation at the County Identification Bureau showed that Curtis was arrested in Sacramento in 1914 on a charge in connection with the passing of fictitious checks. No disposition of the case appears in the records. He is said to have declared at that time that his name was Lawrence W. Hartman. In this city, when he arrived here about ten days ago, he worked on the sympathies of a number of doctors and secured medical attention at St. Joseph's Hospital and at Clark's Sanitarium. He also secured a quantity of dental attention. . . . The police here doubt Curtis' claim to the title of "Doctor," and believe that his credentials are faked. He claims to be a graduate of the University of Calcutta, India, and to have practiced in Shanghai, China.—*Stockton Record,* April 13, 1927.

According to a press dispatch dated Berlin, April 16, published in the New York *Times* of April 17, 1927, "American academic degrees are being offered wholesale in Germany at prices ranging from $300 up." The ambiguous advertisement appearing in several papers and magazines announces that the titles Doctor of Merchandising, or philosophy, civics, dentistry, etc., can be quickly procured without examinations. Applicants answering the advertisement receive a glowing prospectus signed "Ernst Leuchtman, Baron von Reichenau, Director of the Dusseldorf High School for Economics, Delegate to the National Eclectic Institute of the United States of America, Corresponding Professor and Doctor of Philosophy of the National Eclectic Institute. . . . The candidates are assured that no work or study is required. . . . Delivery of a diploma is promised within eight weeks after first payment. . . . Candidates are requested to guarantee the payment of $150 in American currency. . . . The number of victims may be large on account of the fact that many Germans still have a hankering for high-sounding appendages to their names."

According to the reports of our Special Agent, Laura Donoho recently pleaded guilty in Los Angeles to a charge of violation of the Medical Practice Act and was sentenced to pay a fine of $500, sentence suspended on condition that she does not violate the law for a period of five years.

Reports continue to come in of the theft of medicine cases from the automobiles of doctors in different portions of the state, the narcotics having been removed from those cases that have been recovered.

Dr. Davis Grisso, Oakland physician, who has been sought since April 19 in an investigation into the death of Mrs. Theresa Soares, walked into the Oakland morgue yesterday during the inquest into the case. A short time later the coroner's jury found that the "woman died as the result of shock and presumably anesthesia, and in all belief death occurred during the performance of a criminal operation by Davis Grisso." Doctor Grisso was charged with responsibility for her death by the verdict. . . . Mrs. Soares, wife of Anthony Soares, a truck driver of 2021 East Twentieth Street, Oakland, died in Doctor Grisso's office in the Bacon Building, Oakland, on the night of April 18. No report of her death was made until she had been embalmed by W. M. Malliday in the employ of the undertaking firm of Hanrahan and Wadsworth. . . . (Oakland *Times,* April 29, 1927.) The records of the Board of Medical Examiners show that

Davis Grisso's license to practice in the state of California was revoked October 18, 1923, since which time reports are that he has continued to practice, despite information from the legal department of the Board of Medical Examiners that the courts have sustained the Board in the revocation of Doctor Grisso's license. (Previous reference in "News Items," January and February, 1926; January and March, 1927.)

Special Agent Albert Carter recently reported that H. M. Grannell, who claimed to be a graduate of the Pacific Medical College, Los Angeles, 1916, since which time he has practiced in Mexico, recently came to the attention of our department in connection with some prescription blanks reading: "M. Grannell, M. D., 3817 East Fifth Street, Los Angeles, California," said blanks showing the name Dittman Drug Company, 3680 East Fourth Street, at Dittman (Los Angeles). So far as the records show, Doctor Grannell is not licensed in any state or territory of the United States, nor does his name appear on the records of the Pacific Medical College compiled by the Board of Medical Examiners for the past several years. The Pacific Medical College is one of the institutions prominently featured in the diploma mill exposé of 1924. (Previous entries, CALIFORNIA AND WESTERN MEDICINE, January, 1926, and January, 1927.)

Dr. J. A. Hadley, a practicing physician in Arcata, was recently arrested on a charge of murder in the first degree in connection with the death of Louise Baxendale, a 19-year-old Oakland girl, who, according to the Arcata *Union* of April 14, 1927, died as the result of an illegal operation performed by Hadley in the Vaissade Building. The case will go to trial on June 20. Doctor Hadley has been cited to appear before the Board of Medical Examiners on June 28 to show cause why his license to practice in the state of California should not be revoked.

According to a report of Special Agent Carter, a complaint was recently filed in the Municipal Court of Long Beach charging Abbie L. Hurd with violation of the Medical Practice Act. "She has, according to her own statement, been practicing medicine for many years, using mostly herbs in her treatments.

Special Agent Carter reports that on April 18, 1927, a complaint was filed in Los Angeles, charging S. I. Kimbro with violation of the Medical Practice Act, relating that "Prof. S. I. Kimbro is an old offender, having been convicted by a jury in the Los Angeles Police Court on March 5, 1925, and sentenced by Judge Fredrickson to pay a fine of $100 or serve sixty days in the city jail, the jail sentence being served after he had given notice of appeal and failed to file same." The report further relates, in reference to the recent complaint, "One patient, John Mackay of 315 Normandie Court, Redlands, California, who is now at the Hotel Cecil, Los Angeles, says that he went to Kimbro for treatment on January 15, 1927, and that Kimbro injured him in his first examination to such an extent that he has been forced to remain in Los Angeles and under the care of two physicians ever since. From another of his patients he secured $1000 in cash by giving a chattel mortgage on the autonormalizer, as he calls his oscillating couch or table. . . ."

Dr. Elmer C. Litle, convicted of violation of the State Narcotic Law, was sentenced to three years in the county jail yesterday by Superior Judge Craig. A motion for a retrial was denied before sentence was passed. Counsel for the physician gave oral notice that an appeal would be taken.—*Los Angeles Times*, April 30, 1927.

According to report of our Special Agent, Matthew Galt Platt on June 9, 1927, pleaded guilty to a violation of the Medical Practice Act in Los Angeles and was sentenced to serve sixty days in the county jail, said sentence being thereupon suspended for two years on condition that defendant does not violate the Medical Practice Act during the period of probation. The records show that Doctor Platt, a practicing physician in another state, came to California on or about December, 1926, and placed a penciled card on the door of the Santa Fe Springs Emergency Hospital, referring to himself as Dr. M. G. Platt, surgeon, although at the time of so doing he did not hold a license entitling him to practice in this state.

"Pleading guilty to two counts of an indictment charging him with forging narcotic prescriptions, Dr. William Jules Poll, former head of the Tujunga Sanitarium, was given a two-year suspended penitentiary sentence when he appeared before Federal Judge Henning yesterday. Doctor Poll was paroled to Dr. E. H. Anthony, government physician, after the latter had testified that he was convinced Doctor Poll was permanently cured of the drug habit. Doctor Poll admitted he had been a narcotic addict and had forged prescriptions to keep himself supplied with the drug." (Previous entry, "News Items," November, 1926; March, 1927.)

Dr. Alanson M. Pond, mentioned in "News Items" of December, 1926, March and April, 1927, and now a voluntary patient at Patton State Hospital under commitment of two years for treatment as a narcotic addict, has been cited to appear before the Board of Medical Examiners on June 28 to show cause why his reciprocity license to practice as a physician and surgeon in the state of California should not be revoked.

William Shore, M. D., Ventura physician, mentioned in "News Items" of February and March, 1927, has been cited to appear before the Board of Medical Examiners at the regular meeting to be held in San Francisco, June 28, to show cause why his license to practice in California should not be revoked.

Marcus Simpson, who not long since advertised in the Hollywood papers calling himself "king of drugless doctors" and that he could cure heart and kidney troubles in ten minutes and make tubercular lungs normal in three days, was found guilty by a jury in Los Angeles, and on June 2, 1927, sentenced by Judge William Fredrickson to pay a fine of $200 or serve ninety days in the city jail, and paid the fine, according to report from our Special Agent Carter.

According to report of our Investigation Department, "Dr. George N. Stockwell of Ventura, California, was arrested Monday, March 14, on a narcotic charge by J. M. Ferguson of the State Board of Pharmacy. Mr. Ferguson states that they found nearly two ounces of bootleg morphin in Doctor Stockwell's possession in addition to getting a sale on him." (Previous entry, May, 1927.)

Admitting that he called himself Doctor in violation of the State Medical Licensing Act, E. O. Tilburne today filed an application for probation in Superior Judge Edmonds' court. Advertising matter used by the defendant, agent for a health belt, represented him as "Dr." Tilburne, the charges allege . . . (Los Angeles *Herald*, May 17, 1927.) (Previous entries, February and March, 1927.)

Walter J. Wentzel, M. D., Hollywood physician, mentioned in "News Items" of April, 1927, as involved in some narcotic difficulties, has been cited to appear before the Board of Medical Examiners June 28, 1927, to show cause why his license to practice in the state of California should not be revoked.

Because a jury made the unusual mistake of finding a defendant guilty of a crime with which he was not charged, Dr. W. E. Williams today is free of serious charges. Found guilty of manslaughter in connection with the death of pretty Evelyn Frances Taylor, University of Southern California co-ed, following an illegal operation it was charged he performed upon her, Doctor Williams stood before Superior Judge Charles Burnell to hear charges against him dismissed. "We cannot try Doctor Williams for murder again," E. J. Dennison, chief of the District Attorney's Homicide Department, said, "because the jury found him guilty of manslaughter. He was charged with murder originally, but he has been once in jeopardy, and it would be impossible to convict him of the lighter charge of manslaughter." (Los Angeles *Record*, May 17, 1927.) (Previous entries "News Items," April and May, 1927.)